

资产所有者助力中国加速实现碳中和

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1

摘要

中国在经济和社会绿色转型领域取得了巨大成就。在过去十年间，中国的碳排放强度快速下降，中国在绿色能源供应方面的发展远超欧盟和美国。事实上，中国的可再生能源发电装机容量已从 2000 年的 76 吉瓦 迅速提高至 2018 年底的 695 吉瓦，增长率超过 800%。截至目前，美国的可再生能源发电装机容量仅为中国的三分之一，而欧盟约为中国的三分之二。此外，中国正在大力推进交通运输系统电气化，优先推行林业政策，旨在清除大气中的二氧化碳。尽管如此，根据当前的政策预测，到 2030 年，中国的温室气体排放量和《巴黎协定》提出的温度控制目标所要求的排放量仍有较大差距（预计排放量为 142.42 亿吨二氧化碳当量，《巴黎协定》温控目标要求的排放量为 64.52 亿吨二氧化碳当量）。

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金融业需要加快推进绿色转型。中国的绿色金融正在快速发展：当前绿色贷款余额超过 10.6 万亿人民币（约合 1.5 万亿美元），是 2013 年底的两倍以上。自中国于 2016 年开始发行绿色债券以来，未到期绿色债券总额达到 9770 亿元（约合 1400 亿美元），年均增长率超过 30%。此外，中国还成立了数百支绿色基金，同时探索开发绿色股票指数和绿色保险。2017-2018 年中国的年度平均气候投资达 2.1 万亿元人民币。然而据估计，中国在未来（几）十年为实现绿色目标需要每年投资 3.33 万亿元人民币至 9.55 万亿元人民币。因此，绿色金融需要加快发展速度，以弥合资金缺口。

资产所有者将助力中国在 2060 年前实现碳中和的宏伟目标。作为投资组合的最终负责人及全球/区域资本市场的代表，资产所有者通过不同方式来支持碳中和目标并确保为经济社会带来真正的正面影响。第一，资产所有者可以帮助其投资的碳密集型企业制定脱碳路径。第二，资产所有者可以集中更多资源，优先支持难脱碳行业降低总体碳排放强度。第三，资产所有者可以加大气候友好型投资力度，如：可再生能源、绿色建筑、可持续林业和绿色氢气。

中国政府如何满足国际投资者日益增长的需求？国际投资者愿意积极支持中国在 2060 年前实现碳中和的目标。以下几个方面对中国吸引国际投资者尤为重要：1) 创造公平的环境：如果没有公平的环境，率先采取碳减排行

动的国家和企业会受到惩罚，激励措施将适得其反。各国气候政策应该制定严格的碳排放价格，逐步停止化石燃料补贴，并为无法承受额外成本的国家和企业提供支持。

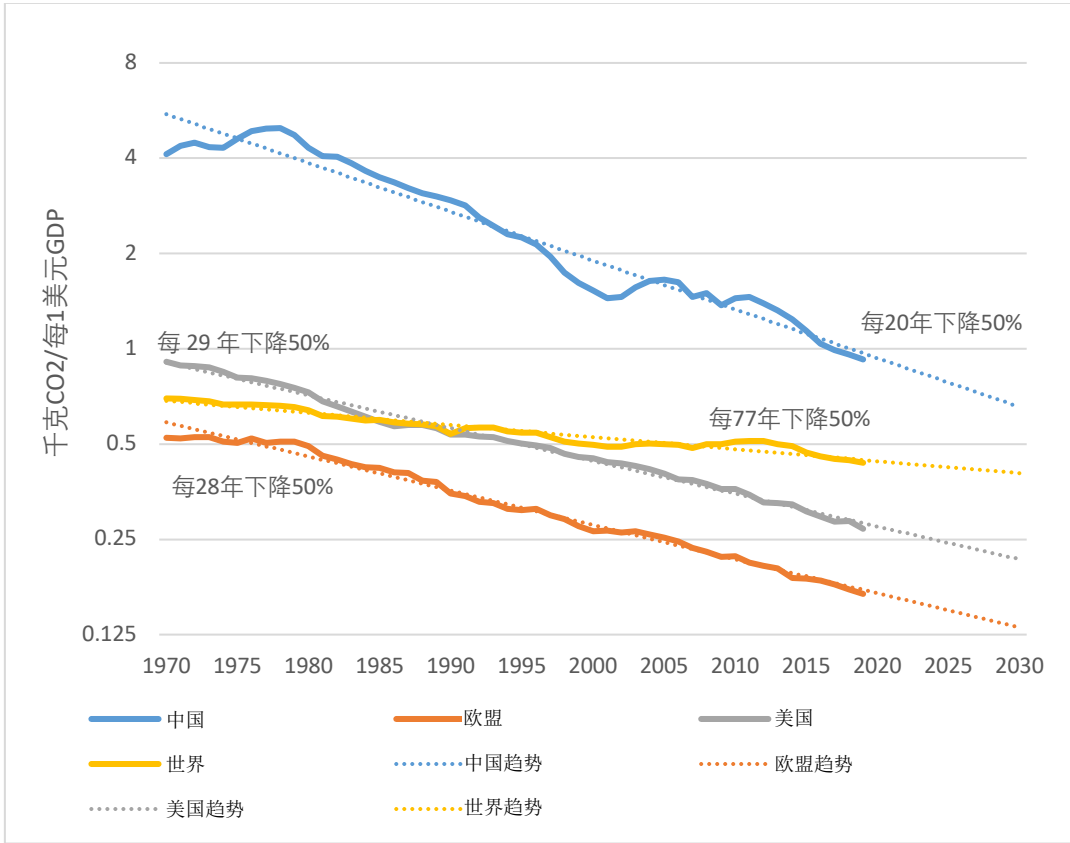
2) 强制性气候报告：监管机构应制定统一的指导意见，集中最重要的一系列指标，因为目前投资者仅能利用与企业之间的互动来获取此类信息，但是这种方式获得的数据规模有限，而且非公开信息也不能用于投资决策。

3) 逐步实行金融市场开放。近期，中国放宽或取消了境内金融企业的外资持股比例限制，这为全球绿色金融合作奠定了基础，并有助于吸引外国投资者支持中国实现零碳经济的目标。此外，由联合国发起成立的“净零资产所有者联盟”目前已有 34 家机构投资者、养老基金、保险公司和主权财富基金加入，管理总资产超过 5.5 万亿美元。该联盟承诺其投资组合在 2050 年实现温室气体净零排放的目标。这是一个机构投资者通过共同努力加强气候保护、为零碳经济转型提供资金的典型示例。如果中国的资产所有者加入，这一联盟也将为中国实现气候目标做出应有的贡献。

1. 中国在经济社会绿色转型领域取得了巨大成就

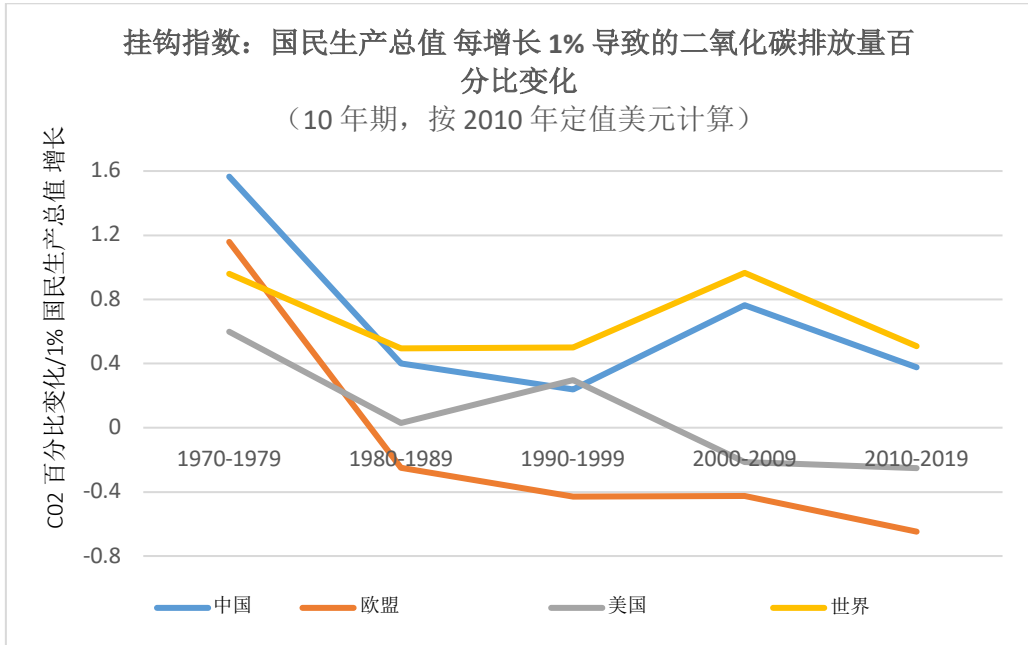
在 2018 年的全球温室气体（GHG）排放量中，中国、欧盟（包括英国）和美国的排放量占比接近一半。但在过去十年间，上述三个国家/地区都在实现经济增长与碳排放增长脱钩方面取得了相当大的进步。根据图 1 显示，在上述三大经济体中，每创造 1 美元 国民生产总值 所排放的二氧化碳均在稳步下降，而中国的下降速度最快。由于中国的国民经济结构偏重制造业，所以中国的碳排放强度起始值较高。但时至今日，中国每创造 1 美元国民生产总值所排放的二氧化碳已经低于 1 千克（2010 年通货膨胀调整后的数值），实现了每 20 年下降 50% 的速度，而美国和欧盟则需要将近 30 年（一代人）才能实现。尽管如此，在保持所有趋势不变的情况下，中国到 2050 年才能赶上世界平均碳强度水平，要赶上美国和欧盟则分别需要到 2140 年和 2200 年。

图 1：碳排放强度：每创造 1 美元 国民生产总值 所排放的二氧化碳（千克 CO₂/1 美元 国民生产总值，对数标记，按 2010 年定值美元计算）



图表来源：安联集团，数据来源：世界银行世界发展指标数据库（WDI）、
 欧盟委员会全球大气排放研究数据库（EDGAR）

图 2：“挂钩指数”，国民生产总值 每增长 1% 导致的二氧化碳排放量百分比变化（10 年期，按 2010 年定值美元计算）

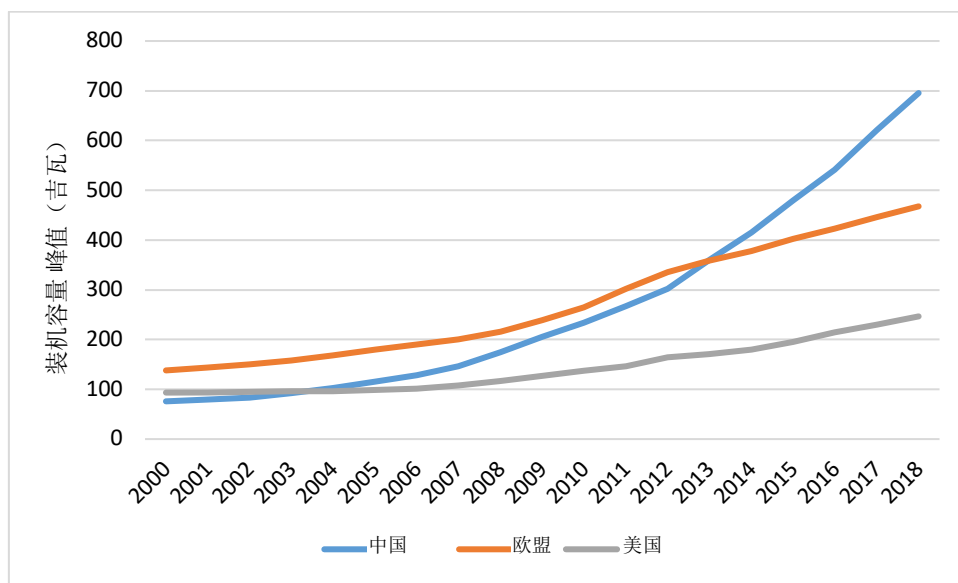


数据来源：世界银行世界发展指标数据库（WDI）、欧盟委员会全球大气排放研究数据库（EDGAR）

这种脱钩当然得益于中国经济结构从制造业向服务业的转变，但更起决定性作用的一个因素是**绿色能源供应**，中国在这方面的发展速度远超欧盟和美国。2000 年，中国的可再生能源发电装机容量仅为 76 吉瓦，而这一数字在 2018 年底跃升至 695 吉瓦，增长率超过 800%。相比之下欧盟和美国同期的

增长率仅为 230% 和 160%。目前，美国的可再生能源发电装机容量约为中国的三分之一，而欧盟约为中国的三分之二。2000 年，这三大经济体的装机容量则大致相同（见图 3）。

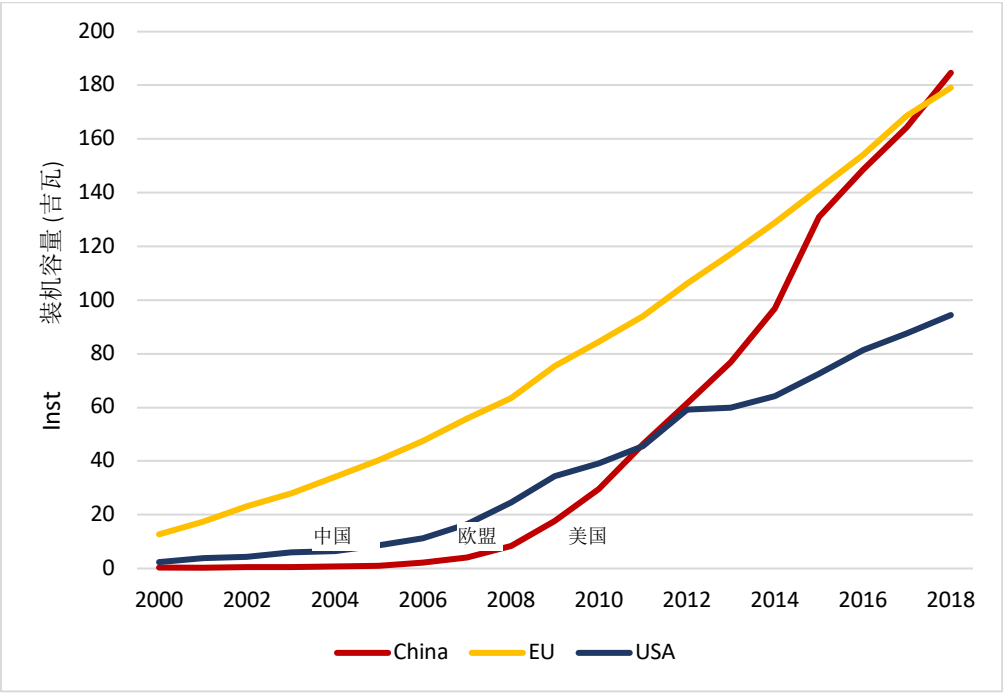
图 3：可再生能源发电：装机容量



图表来源：安联集团经济研究部门，数据来源：经济合作与发展组织（OECD）

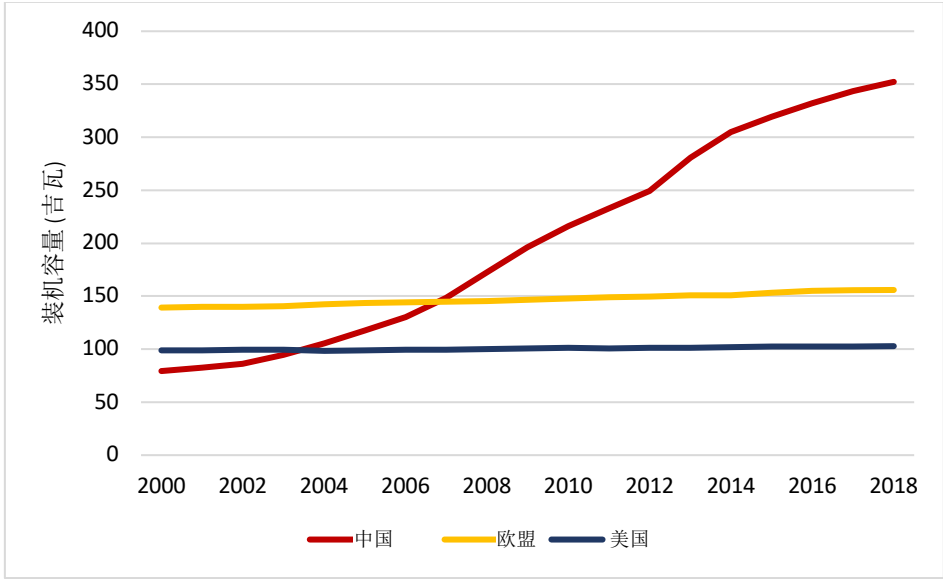
根据细分行业数据，我们可以看到 2017 年中国的风力发电装机容量已超过欧盟（见图 4）。自 2000 年以来，中国的水力发电装机容量也大幅增长了 300%，达到 352 吉瓦，而欧盟和美国增长甚微（见图 5）。此外，中国的太阳能发电装机容量也达到了 175 吉瓦，而欧盟和美国的装机容量则相形见绌，分别仅为 117 吉瓦 和 53 吉瓦（见图 6）。

图 4：风力发电：装机容量



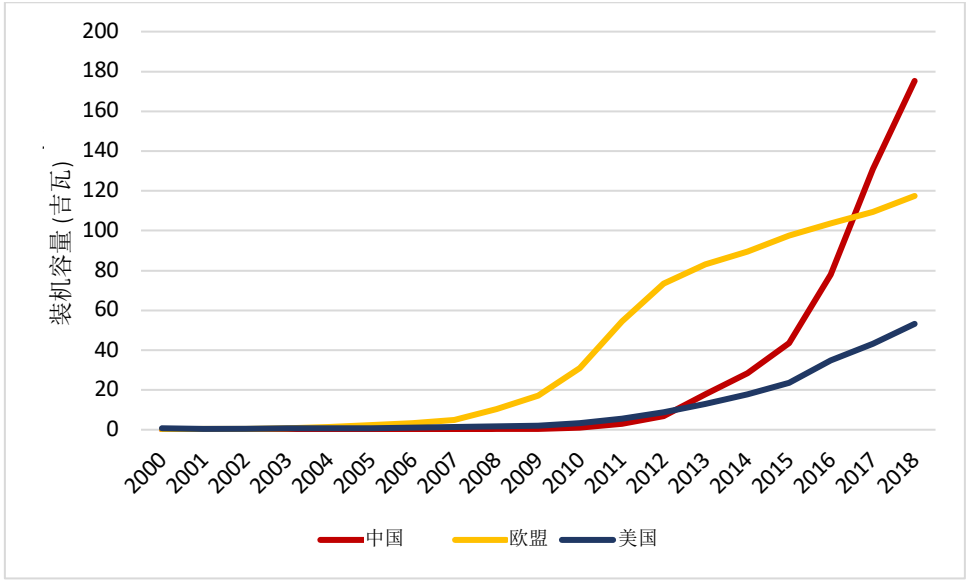
图表来源：安联集团经济研究部门，数据来源：国际可再生能源署（IRENA）

图 5：水力发电：装机容量



图表来源：安联集团经济研究部门，数据来源：国际可再生能源署（IRENA）

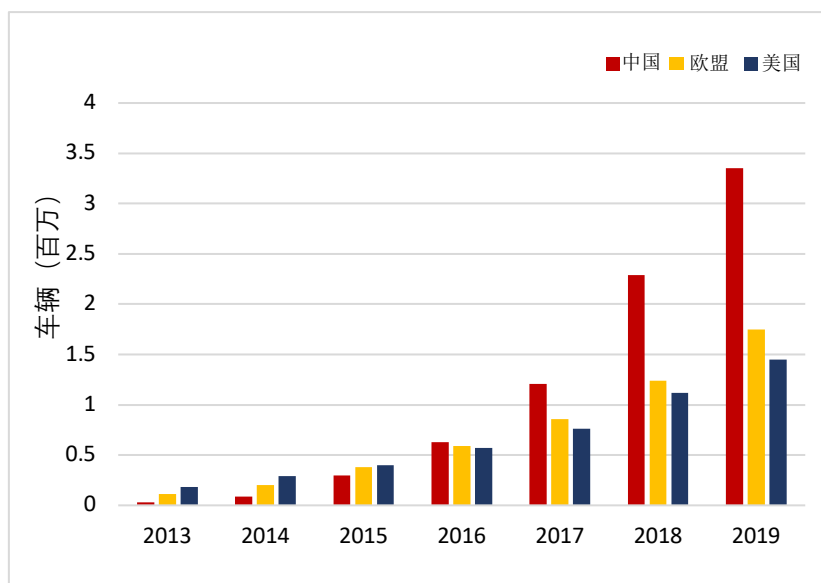
图 6：太阳能发电：装机容量



图表来源：安联集团经济研究部门，数据来源：国际可再生能源署（IRENA）

由于交通运输的排放量占温室气体排放总量的四分之一至五分之一（基于“从油井到车轮”排放量），因此，推行电动车对于实现《巴黎协定》的气候目标尤为重要。中国在**交通运输系统电气化**方面也处于领先地位：截止到2019年底，中国的电动车存量为335万辆，较2018年（229万辆）增长了50%以上。相比之下，欧盟和美国在2019年的电动车存量仅分别为175万辆和145万辆（见图7）。

图 7：电动车存量



图表来源：安联集团经济研究部门，数据来源：国际能源署（IEA）

为清除大气中累积的二氧化碳制定积极的专项政策，对于实现《巴黎协定》气候目标也将发挥重要作用。造林/再造林、生物能结合碳捕集与封存技术（BECCS）等负排放技术和解决方案是将二氧化碳从大气中清除的重要手段。在上述三个国家/地区中，尽管中国的森林覆盖率最低（2016 年，中国的森林覆盖率为 22%，而美国为 34%，欧盟为 40%），但中国政府的林业政策最富有雄心。中国的天然林保护工程是全球规模最大的森林保护工程，其中包括大规模植树工程、扩大森林保护区和禁止砍伐原始森林。中国政府为这些森林保护工程投入了大量资金，其规模超过美国或欧盟。中国为保护每公顷森林投入的资金是全球平均资金额的三倍以上²。在 2016-2018³ 年期间，中国每年植树造林 700 万公顷，并提出了在 2035 年实现森林覆盖率 26% 的目标。

在**碳捕集与封存技术**（CCS）领域，欧盟和美国则处于领先地位。此类技术捕集二氧化碳排放量并进行封存，不会再将其释放大气中。由于缺乏足够的数据和标准化的衡量方法，在此很难对此类技术的储备容量进行比较分

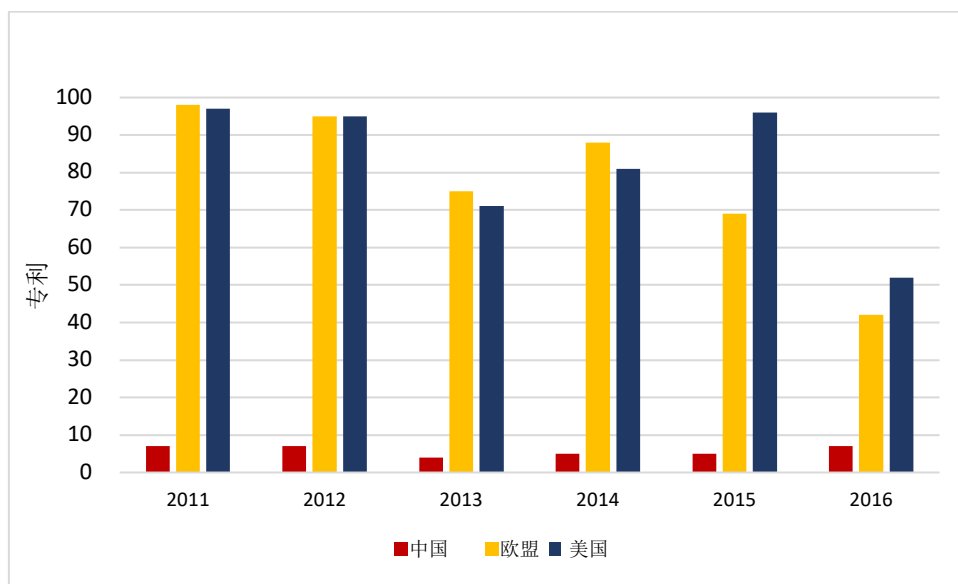
² Sandalow, 2019

³ 国家发改委，《中国应对气候变化的政策与行动》（China's Policies and Actions for Addressing Climate Change）（2016 年 10 月）第 20 页；国家发改委，《中国应对气候变化的政策与行动》（China's Policies and Actions for Addressing Climate Change）（2017 年 10 月）第 15 页；国家发改委，《中国应对气候变化的政策与行动》（China's Policies and Actions for Addressing Climate Change）（2018 年 11 月）第 16 页。另请参见：国家统计局，《2018 年国民经济和社会发展统计公报》（Statistical Bulletin on National Economic and Social Development in 2018）（2019 年 2 月 28 日）第十二部分；国家统计局，《2017 年国民经济和社会发展统计公报》（Statistical Bulletin on National Economic and Social Development in 2017）（2018 年 2 月 28 日）第十二部分。

析。但是，与 CCS 技术相关专利的发展趋势则显示了此项技术的良好前景。

图 8 表明，欧盟和美国签发的 CCS 专利明显多于中国。

图 8：新 CCS 专利

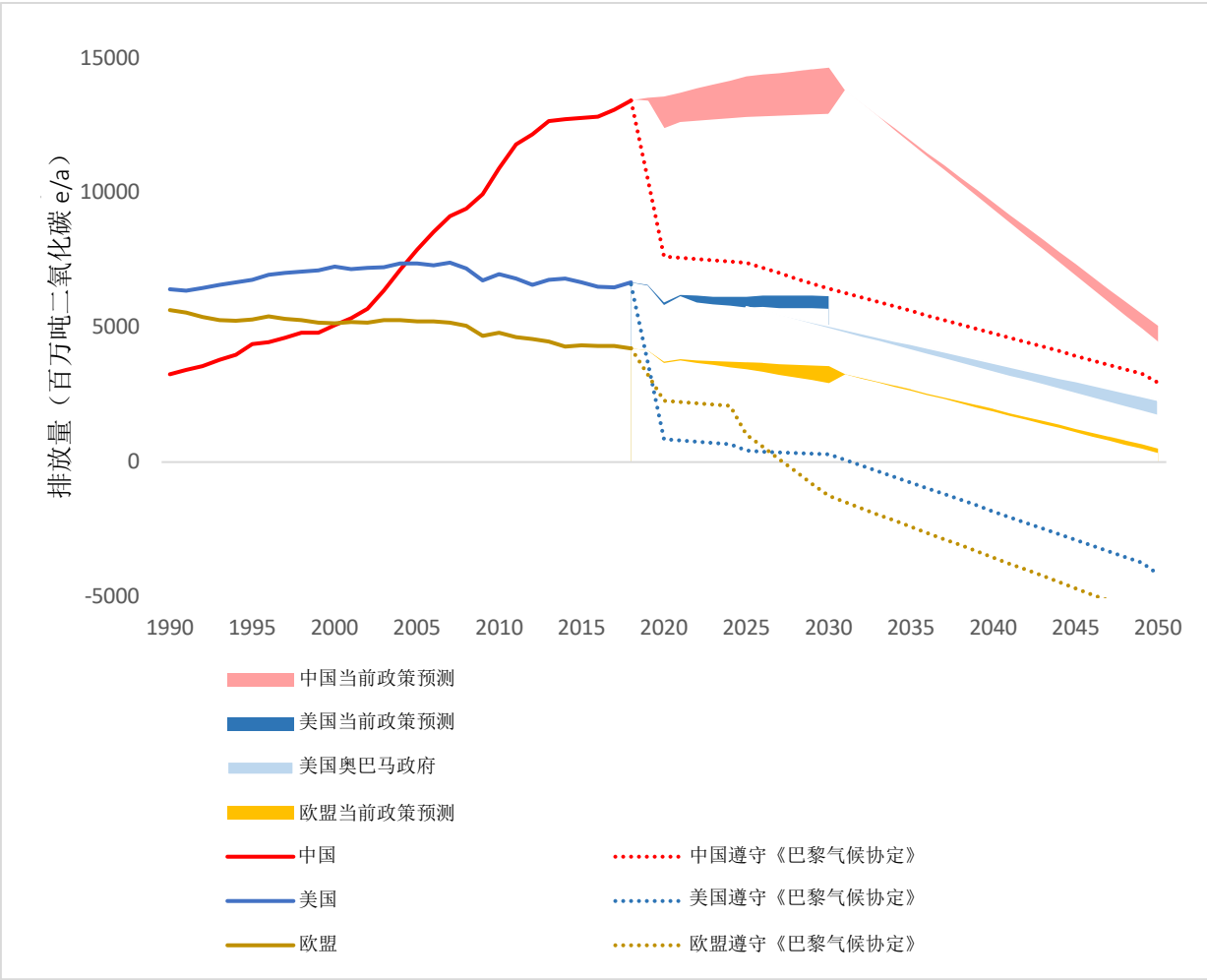


图表来源：安联集团经济研究部门，数据来源：经济合作与发展组织（OECD）

尽管上述三个国家/地区在碳减排方面都取得了进展，但还远未达到将全球升温限制在 1.5° C 以内所需要的碳减排力度。根据中国目前的政策预测（不包括即将出台的十四五规划），到 2030 年，中国的温室气体排放量和《巴黎协定》提出的温度控制目标所要求的排放量仍有较大差距（预测 142.42 亿吨二氧化碳当量，《巴黎协定》温控目标要求的排放量为 64.52

亿吨二氧化碳当量)。在这种情况下，金融行业显然需要弥合绿色融资方面的差距，将中国的“绿色转型”提升到一个新高度。

图 9：温室气体排放预测：当前政策：2.8° C，《巴黎协定》目标：1.5° C



图表来源：安联集团经济研究部门，数据来源：气候行动追踪组织⁴

2. 金融业需要加快推进绿色转型

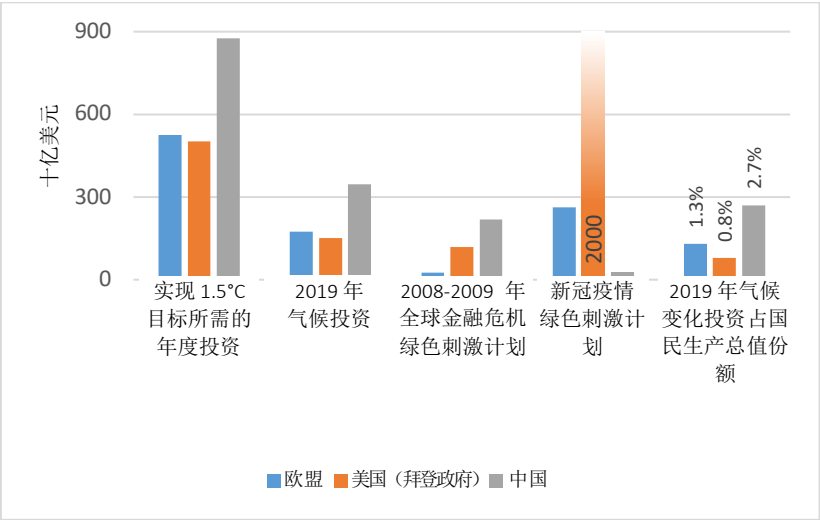
a. 绿色投资面临巨大的资金缺口

尽管上述三个国家/地区已经为减缓气候变化投入了大量资金，但是要实现《巴黎协定》制定的将全球升温限制在远低于 2° C 的水平，所需投资额是当前的三倍（见图 10）。而且这些投资需要集中在未来 10-15 年间，以满足现有的碳减排预算并把握重要的再投资周期。欧盟、美国和中国在 2019 年的气候变化投资额分别占国民生产总值的 1.3%、0.8% 和 2.7%。图 10 还表明，相较 2008-2009 年全球金融危机期间经济刺激计划的绿色投资额，美国和欧盟当前经济刺激计划的绿色投资额翻了几倍。但是，政府的刺激计划仅能作为私营部门投资的补充，因为仅凭经济刺激计划远不足以实现碳中

⁴ 对于政策预测和国家自主贡献，气候行动追踪组织网站重点关注来自能源消耗、工业、农业和废弃物来源的排放，上述总量约占全球温室气体排放量的 93%。在当前的政策预测和国家自主贡献中，土地利用、土地利用变化和林业（LULUCF）产生的温室气体排放量未被纳入考虑范围。LULUCF 产生的温室气体排放量之所以未被纳入考虑范围，是因为 LULUCF 排放量的减少可能会掩盖能源和工业排放量的增加，掩盖碳减排的真实情况。

和目标。根据英国剑桥计量经济学会的一项分析发现，严格遵循气候目标的经济复苏与可使国民生产总值实现近 5% 的额外增长。详见本文附录“全球复苏的“绿色”程度如何？”以及刺激计划中的更多细节。

图 10：减缓气候变化方面的投资



图表来源：安联集团经济研究部门。基于以下数据来源的自行计算：世界资源研究所 WRI (2020)，Jaeger 教授等人 (2020)、欧洲投资银行 EIB (2021)、国际可再生能源署 IRENA (2020)。IRENA 区域投资的要求按一次能源总供应量 (TPES) 在不可再生能源中的份额进行分配 (就不可再生能源的一次能源总供应量而言，中国占东亚地区的 78%，美国占北美地区的 82%)。

研究⁵表明，绿色金融的发展依然远低于实现《巴黎协定》目标所需的水平。联合国政府间气候变化专门委员会（IPCC）⁶估计，到2050年，全球能源系统供应端所需的新的气候投资至少为1.6-3.8万亿美元，这远高于过去几年气候金融发展的趋势（见图11）。实现气候目标需要不同的经济参与主体进一步加大合作力度。

对中国来说，不同机构对绿色投资的需求预估虽各不相同，但都表明仍存在重大的资金缺口。中国环境与发展国际合作委员会（CCICED）⁷的研究表明，2021-2030年期间中国的年度绿色投资需达到9.55万亿元人民币，才能实现2015年制定的绿色目标和标准。国家应对气候变化战略研究和国际合作中心（NCSC，2019）⁸发现，为应对气候变化所需的年均投资额已经从2016-2020年间的2.9万亿元人民币上升至2021-2030年间的4.15万亿元人民币⁹。清华大学气候变化与可持续发展研究院（ICCSA，2020）¹⁰估计，

⁵ <https://www.greenfinanceplatform.org/page/explore-green-finance>

⁶ 《IPCC关于全球升温1.5°C特别报告》（IPCC Special Report on Global Warming of 1.5°C）

⁷ 《绿色金融改革与促进绿色转型研究》（Green finance reform and green transformation），中国环境与发展国际合作委员会（2015）

⁸ 《中国实施2030年应对气候变化国家自主贡献的资金需求研究》（Financial needs in implementing China's nationally determined contribution to address climate change by 2030），国家应对气候变化战略研究和国际合作中心（2019）

⁹ 更准确地说，根据估算，“十三五”规划期间（2016-2020年）的年均资金需求为2.9万亿元人民币；“十四五”规划期间（2021-2025年）为3.8万亿元人民币，“十五五”规划期间（2026-2030年）为4.5万亿元人民币。

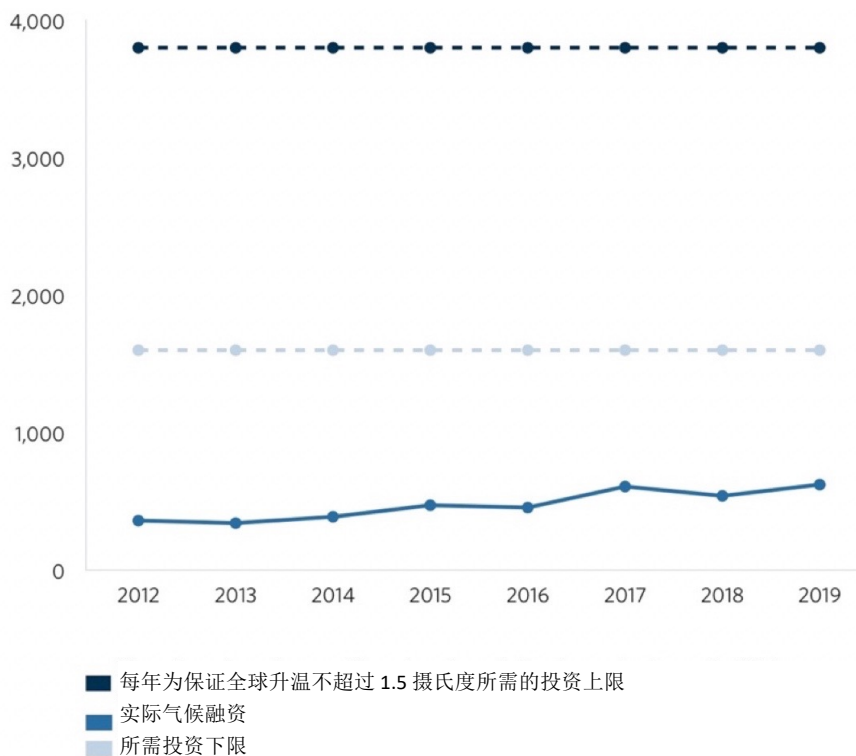
¹⁰ 《中国长期低碳发展战略与转型路径研究》（Study on China's long-term low carbon development strategy and transition pathway），清华大学气候变化与可持续发展研究院（2020）

如需实现升温低于 2°C 的目标，2020–2050 年间中国能源系统平均每年需要约 3.33 万亿元人民币的新投资。如需实现升温低于 1.5°C 的目标，2020–2050 年平均每年需要约 4.6 万亿元人民币的新投资。

相较而言，气候政策倡议组织（2021）¹¹的研究则显示 2017–2018 年中国整体绿色金融年均投资额为 2.1 万亿元人民币。国家应对气候变化战略研究和国际合作中心 NCSC（2019）发现，中国每年将面临约 1.4 万亿元人民币的资金缺口。

¹¹ 《中国扩大气候金融规模的潜力》（The potential for scaling climate finance in China），气候政策倡议（2021）

图 11：全球层面的气候融资与所需投资额（10 亿美元）

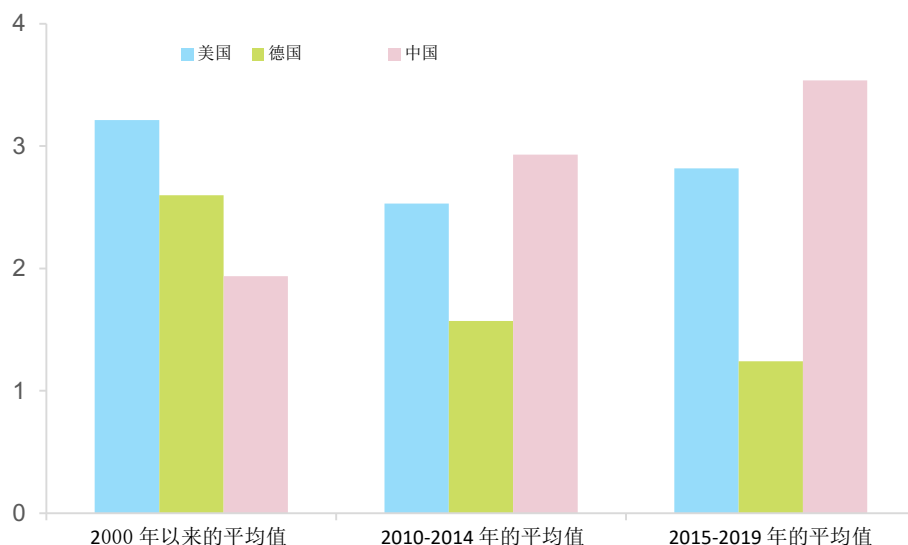


数据来源：绿色增长知识合作伙伴关系

对绿色融资规模需求的显著提升与中国信贷效率的下降有关。我们的信贷强度指数显示，中国的信贷强度指数处于上升趋势，这表明创造单位国民生产总值所需的信贷金额不断增加。事实上，该指数在 2016-2018 年间一直在下降（大致在中国实施去杠杆化政策期间），近期（伴随贸易紧张局势和全

球疫情背景下采取的宽松政策) 又开始上升。由于中国政府致力于实现长期可持续、平衡的经济增长模式, 因此优先为可持续经济领域提供资金就显得尤为重要。此外, 劳动强度与绿色复苏¹²之间的正向关系是政府鼓励金融系统为绿色转型提供资金的另一驱动力。

图 12: 信贷强度



数据来源: 国际清算银行、国际货币基金组织、安联集团经济研究部门

¹² 《后疫情时代的经济刺激政策如何同时创造就业和帮助应对气候变化》(How a post-pandemic stimulus can both create jobs and help the climate), 麦肯锡公司, 2020年5月。

b. 中国金融行业可扮演更重要的角色

i. 中国绿色金融的现状

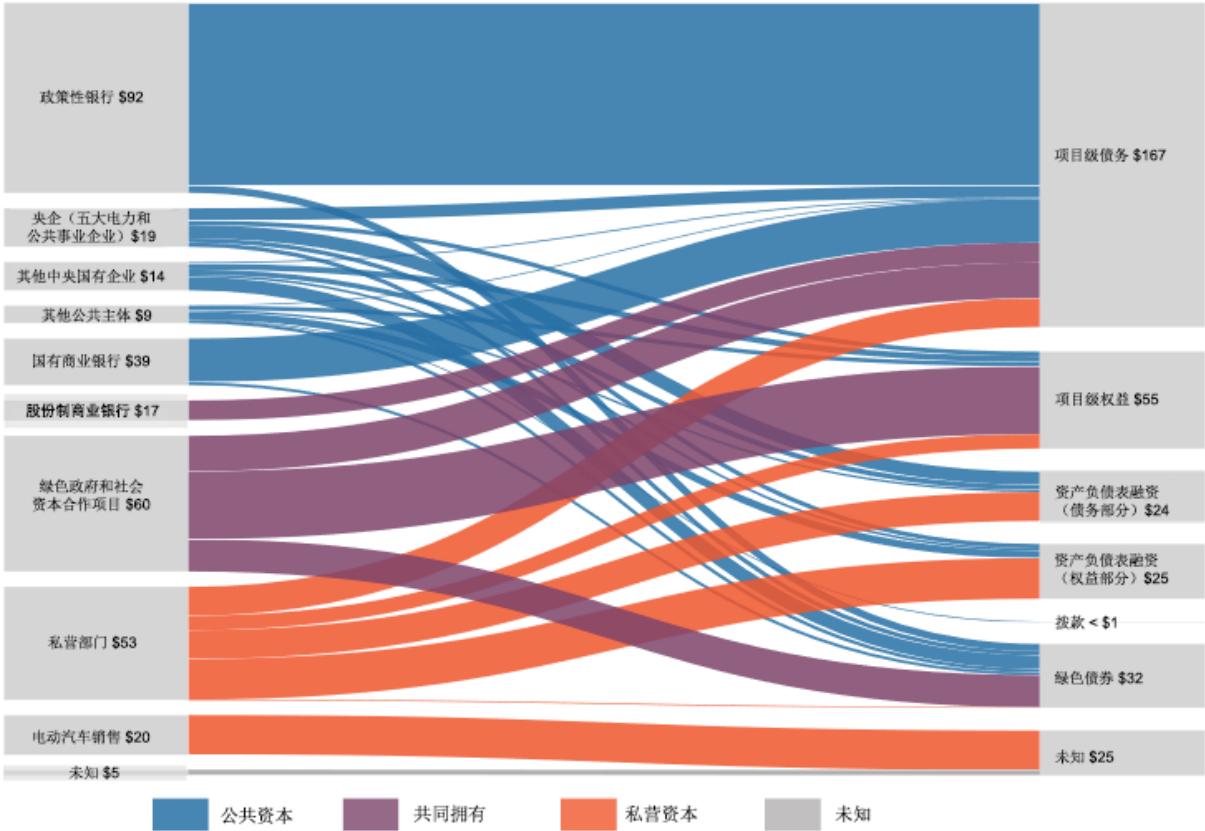
中国将绿色金融作为 2016 年 G20 峰会有一个主要议题，并在同年宣布了建立全国绿色金融体系的蓝图。中国绿色金融改革进展迅速，目前已经初见成果。研究显示¹³，目前中国绿色贷款余额已超过 10.6 万亿人民币（约合 1.5 万亿美元），是 2013 年年底的两倍多。自 2016 年中国开始发行绿色债券以来，目前未到期绿色债券总额达 9770 亿元（约合 1400 亿美元），年均增长率超过 30%。相比之下，2007-2019 年期间全球绿色债券累计发行量为 7540 亿美元。此外，中国还成立了数百支绿色基金，并探索开发绿色股票指数和绿色保险产品。2017-2018 年期间，中国平均每年在气候相关领域投入 2020 亿美元，在其他环保领域投入 1180 亿美元。

图 13 提供了按投融资主体和融资工具统计的绿色金融细分数据。需要重点关注的是，公共资本占绿色融资总额的 51%，其来源包括政策性银行（44%）、部分中央和省级国有企业、国有银行和股份制银行；绿色融资中

¹³ 《中国扩大气候金融规模的潜力》（The potential for scaling climate finance in China），气候政策倡议（2021）

的 21% 来自公私合营项目，24% 来自私营部门。因此，鼓励私人资本参与中国的绿色转型仍存在很大的空间。

图 13：按投融资主体估算的融资工具细分数据（单位：10 亿美元，2017-2018 年期间年平均值）



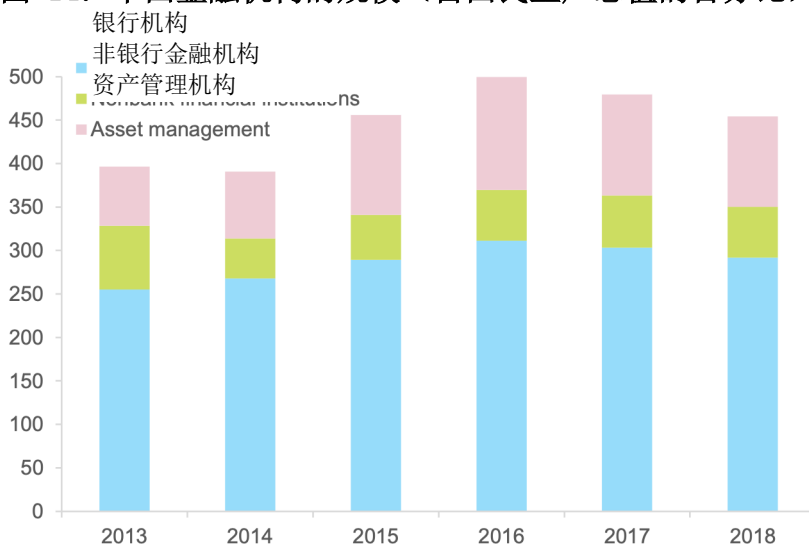
数据来源：气候政策倡议组织

ii. 中国绿色金融的增长潜力

中国绿色金融的增长源自两个方面：1/ 整个金融行业未来将持续增长；2/ 通过政策引导可进一步推动金融业支持绿色转型。

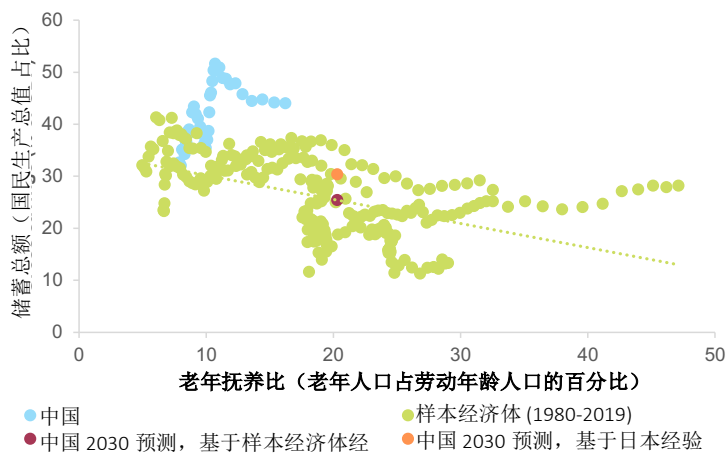
中国金融业正在快速发展（见图 14），并将随着人口老龄化和国民储蓄的释放继续保持增长趋势（见图 15）。2020 年，中国的国民储蓄总额占国民生产总值的 45%，这个比例将随着人口老龄化的趋势而进一步下降。根据国际货币基金组织的预测，到 2025 年，中国的国民储蓄总额在国民生产总值中所占的比例将下降至 40%。

图 14：中国金融机构的规模（占国民生产总值的百分比）



数据来源：国际货币基金组织《金融体系稳定性评估》（2017年12月），
安联集团经济研究部门

图 15：国民储蓄率与老年抚养比，根据历史经验对 2030 年进行预测



注：样本经济体包括日本、韩国、台湾、俄罗斯、欧元区、英国和美国。根据所有样本国家的经验，以及仅根据日本的经验，我们估算了 2030 年中国的储蓄率。

数据来源：国际货币基金组织、世界银行、联合国、安联集团经济研究部门

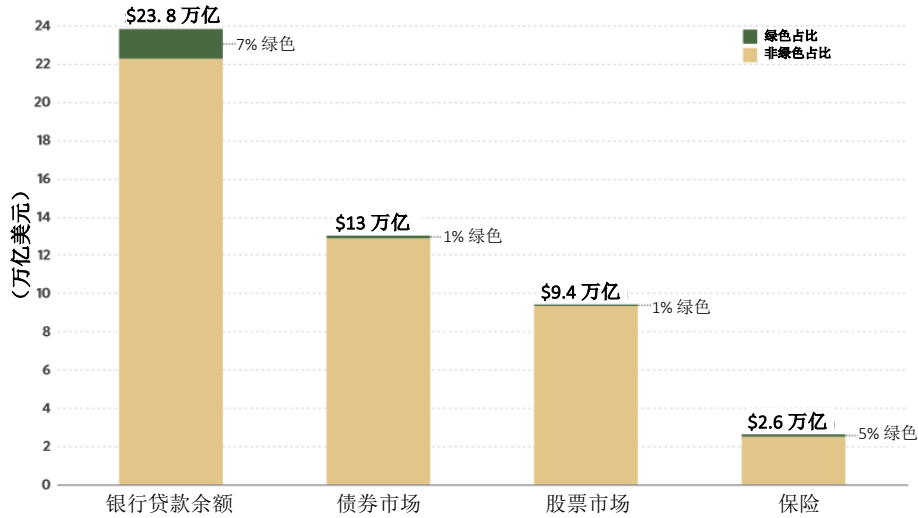
其次，金融业可进一步聚焦绿色转型。研究¹⁴表明，目前中国金融体系的绿色渗透率仅为 4% 左右（见图 16）。随着中国资本市场不断发展以及市场参与者对绿色金融工具的不断熟悉，中国金融体系的绿色渗透率将有所提高。实际上，研究¹⁵表明，提高银行全部贷款组合中的绿色贷款比例可降低整体不良贷款率。相关数据显示，绿色贷款确实提高了财务绩效。在 2017-2018 年期间，绿色贷款的平均不良贷款率为 0.48%，比企业贷款低 1.81 个百分点。在绿色债券方面，未来五年将有 1240 亿美元（约合人民币 8655 亿元）的债券到期，占未到期债券总额的 88%。这为绿色债券再融资提供了重大机遇。

在绿色股票方面，相关部门正在讨论启动绿色企业 IPO 的快速通道，并且已经建立了多个绿色指数和多支绿色基金。而且，中国投资者还可以选择一系列以环境、社会和公司治理(ESG) 为主题的金融产品。在基于 ESG 综合评分建立的 19 个指数中有一半是在 2020 年发布的。此外，2020 年中国的 ESG 主题基金管理的总资产与 2019 年相比增长了 50%。

¹⁴ 《中国扩大气候金融规模的潜力》（The potential for scaling climate finance in China），气候政策倡议（2021）

¹⁵ 《绿色贷款对中国信贷风险的影响》（The impact of green lending on credit risk in China），Cui 等人（2018）

图 16：2020 年第 1 季度金融资产的绿色份额比较



注：各资产类别规模基于中国银保监会和中国证监会 2020 年 1 季度数据；绿色份额基于气候政策研究所的研究报告进行估计。

数据来源：气候政策倡议组织

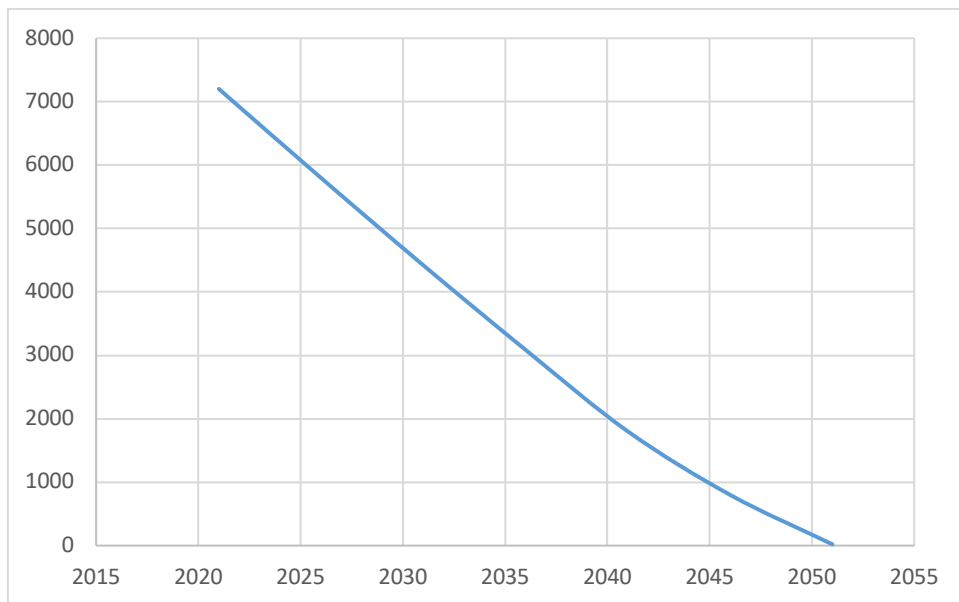
c. 资产所有者可为实体经济带来真正的变革

i. 防范和管理与气候相关的转型风险，实现有序转型

中国国内的煤炭生产活动仍令人担忧。中国于 2018 年取消了此前颁布的新煤厂建设禁令，此后一直在扩大产能。截至 2020 年中，获得许可的新建煤厂数量已经超过 2018 年和 2019 年的数量总和。

随着投资者越来越注重可持续性，投资组合结构的相应变化必然要求严格削减化石燃料的使用，尤其需要削减煤炭发电量。削减化石燃料造成的损失将会由其他行业的经济效益增长及就业增加来弥补，同时削减化石燃料也会在促进生物多样性和居民健康方面获得显著成效。然而为了实现这些收益，一些与化石能源相关的现有资产将面临闲置风险。燃煤电厂的情况很可能就是如此。

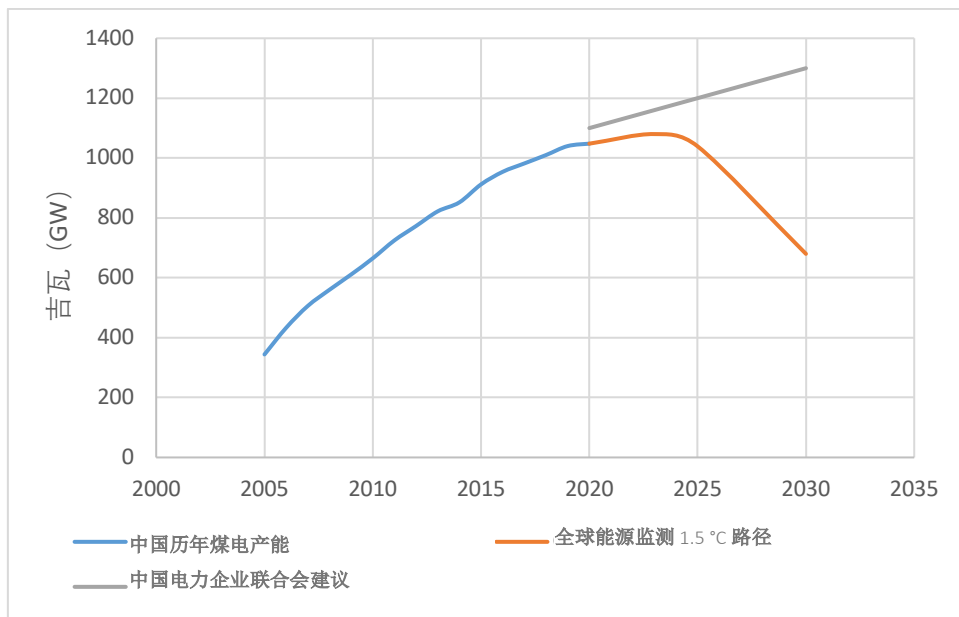
图 17：燃煤电厂资产在险价值预估（10 亿元人民币）



数据来源：安联集团，根据 Caldecott 等(2016) 的研究

图 18 显示了中国当前可能面临闲置风险的燃煤电厂的资产价值。这个数值将随着新建电厂的增加而有所上升，但随着时间的推移及旧电厂的关闭，长期来看将逐步下降。其他可能面临闲置风险的资产则与煤炭开采有关。本文在此对这部分在险价值不作评估。另外由于产能过剩，现有燃煤电厂未能得到充分利用，导致投资成本无法完全收回，此类燃煤电厂的部分价值已被视为闲置资产价值。

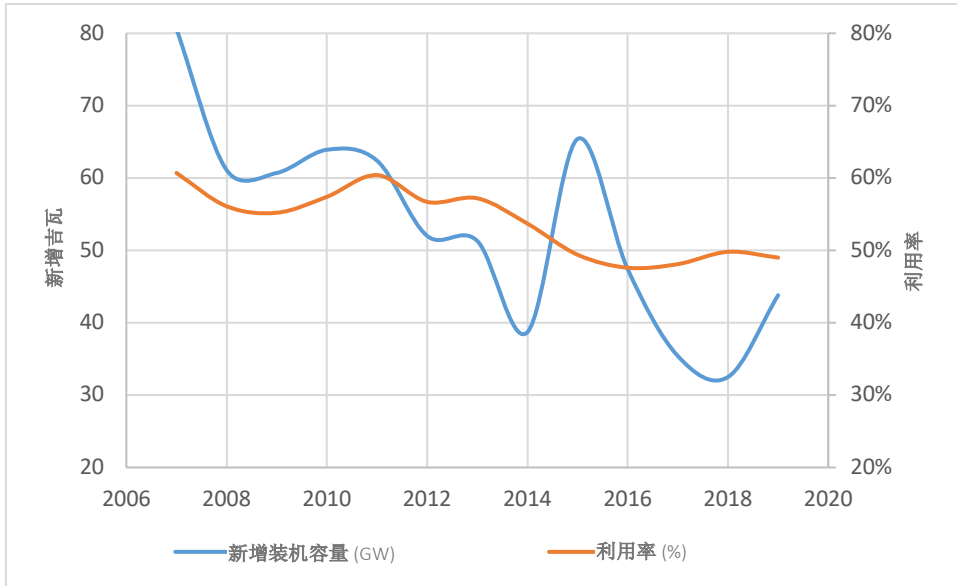
图 18: 基于升温 1.5° C 目标 的中国煤电装机容量



数据来源: 安联集团, 根据 Myllyvirta 等(2020) 的研究

根据图 19 所示, 超过一半的燃煤电厂已处于亏损状态, 典型电厂的实际产能仅为预期产能的 50%, 并呈现明显的下降趋势。正如前文所述, 随着中国提出富有雄心的气候变化目标, 燃煤电厂僵尸化问题将愈发严重。然而, 电网运营商(国家电网)和电力行业机构(中国电力企业联合会)一直在推动新建数百座燃煤电站。此举与当前行业产能过剩的现状相矛盾。如图 18 所示, 为保证将升温幅度控制在 1.5° C 内, 煤电装机容量需要在 2023 年达到峰值, 而到 2030 年, 煤电装机容量应降至 63%。

图 19：燃煤电厂新增装机容量及利用率



数据来源：安联集团，根据 Myllyvirta 等(2020) 的研究

中国煤电产能过剩的问题从“十二五”（2011-2015 年）期间开始显现，这是全球金融危机后实施的财政刺激计划导致的结果，旨在大规模发展煤矿开采和燃煤发电行业。但是在新冠疫情危机期间不应再实行这样的措施。后疫情时代的绿色复苏之路将是中国实现绿色转型、实现潜在经济效益的关键。

截至目前，中国的绿色金融改革并未对化石燃料行业产生显著影响。在中国，广义的“绿色能源”包含洁净煤以及利用清洁能源技术处理过后的化石燃料，这在国际上存在一定争议。此外，中国尚未发布针对化石燃料的限制清单，中国的主要金融机构也未公开承诺减少对化石燃料的投资。确保在气候友好型和气候有害型投资两大方面同时取得突破，将是中国未来几年推进气候行动的关键点。2020年10月，国家五部委联合发布《关于促进应对气候变化投融资的指导意见》，该指导意见首次将“气候”金融和《巴黎协定》中的目标明确认定为政策目标。

资产所有者可在中国政府解决能源资产闲置方面发挥重要作用。他们可以与其所投资的碳密集型企业共同协作，制定企业向低碳商业模式转变的可行战略。通过实行投资组合减排追踪、压力测试评估等措施，资产所有者还可帮助企业提升技术能力来满足监管要求。这些评估也有助于了解气候相关的转型风险和实际操作风险，以便资产所有者及时调整投资组合、确保财务稳定。

ii. 为未来融资

资产所有者可以通过加大对气候有利的投资（包括新兴市场的可再生能源、绿色建筑、可持续森林、绿色氢气）为低碳转型提供资金。在中国，金融行业的不同领域以及地方政府均在探索创新的气候金融产品和渠道（见下框）。

中国气候金融的创新

三类在中国更具创新性的绿色融资渠道¹:

- **消费者渠道:** 以支付宝和微众银行为代表的数字零售消费金融渠道正在努力追求创新, 以多种新方式鼓励消费者、个人投资者和中小型企业通过其移动支付平台培养绿色环保意识及生活方式。2019年, 中国的移动支付交易额达到了 347.11 万亿元 (约合 51 万亿美元), 比 6 年前增长了 28 倍以上。2016 年 8 月, 阿里巴巴在支付宝平台上启动“蚂蚁森林”生态保护计划, 鼓励用户减少碳足迹, 并根据用户积累的能量值为用户种植真树。每位用户均可通过步行或乘坐公共交通工具、使用在线支付或避免使用塑料袋等低碳行为, 为个人碳账户积累虚拟“绿色能量”, 该能量累计达到一定值后就可以在支付宝上种一棵虚拟树, 相应的蚂蚁森林就会帮用户种下一棵真树。截至 2019 年 8 月, 中国有 5 亿多人参与了蚂蚁森林活动, 累计减少了 792 万吨的碳排放, 并在内蒙古干旱地区以及甘肃省、青海省和山西省种植了超过 1.22 亿棵树。
- **中小型企业对接平台:** 作为绿色金融试点城市之一的湖州市正在试行创新渠道, 帮助当地中小型企业获得绿色融资机会。为了支持本地中小型企业的绿色增长, 湖州市政府于 2018 年启动了绿色金融一站式服务平台。自上线以来, 该平台已经吸引了 16,000 多家中小型企业、30 多家金融机构和近 80 家投资机构。在绿色信贷方面, 已有 13,000 多家中小型企业成功获得了超过 1600 亿人民币 (约合 230 亿美元) 的银行贷款。该平台主要为中小型企业提供三项金融服务。第一, 帮助企业与银行对接, 促进绿色信贷流程。该平台还汇集了全国企业的信息, 包括商业经营、税收和环境绩效, 使跨省数据共享成为可能。第二, 该平台可以帮助企业与投资者建立直接联系, 降低管理成本, 提高透明度。投资者可以在平台上审查企业的详细信息, 比较所有可选企业和项目, 同时企业也可以通过该平台吸引更多投资者, 扩展融资来源。第三, 该平台建立了一个绿色信用评级系统, 用于识别符合资质要求的绿色项目和企业, 在此基础上政府将计划向评级为“绿色”的企业发放补贴。
- **绿色保险**是一种用于实现环境风险成本内部化和绩效管理风险的重要金融工具。保险的风险预防机制有助于增强气候韧性并鼓励投资。在中国, 主要的绿色保险产品有两种: 环境污染责任保险 (EPL) 和气候保险。尽管绿色保险可以成为管控环境责任和气候风险的一项重要市场机制, 但目前其发展仍处于初级阶段。此外, 保险资金投资绿色行业板块的比例仍然较低。国内保险公司管理的资产总额约为 17.8 万亿人民币 (约合 2.6 万亿美元), 其中仅 5% (8820 亿人民币或 1300 亿美元) 投资于绿色行业。

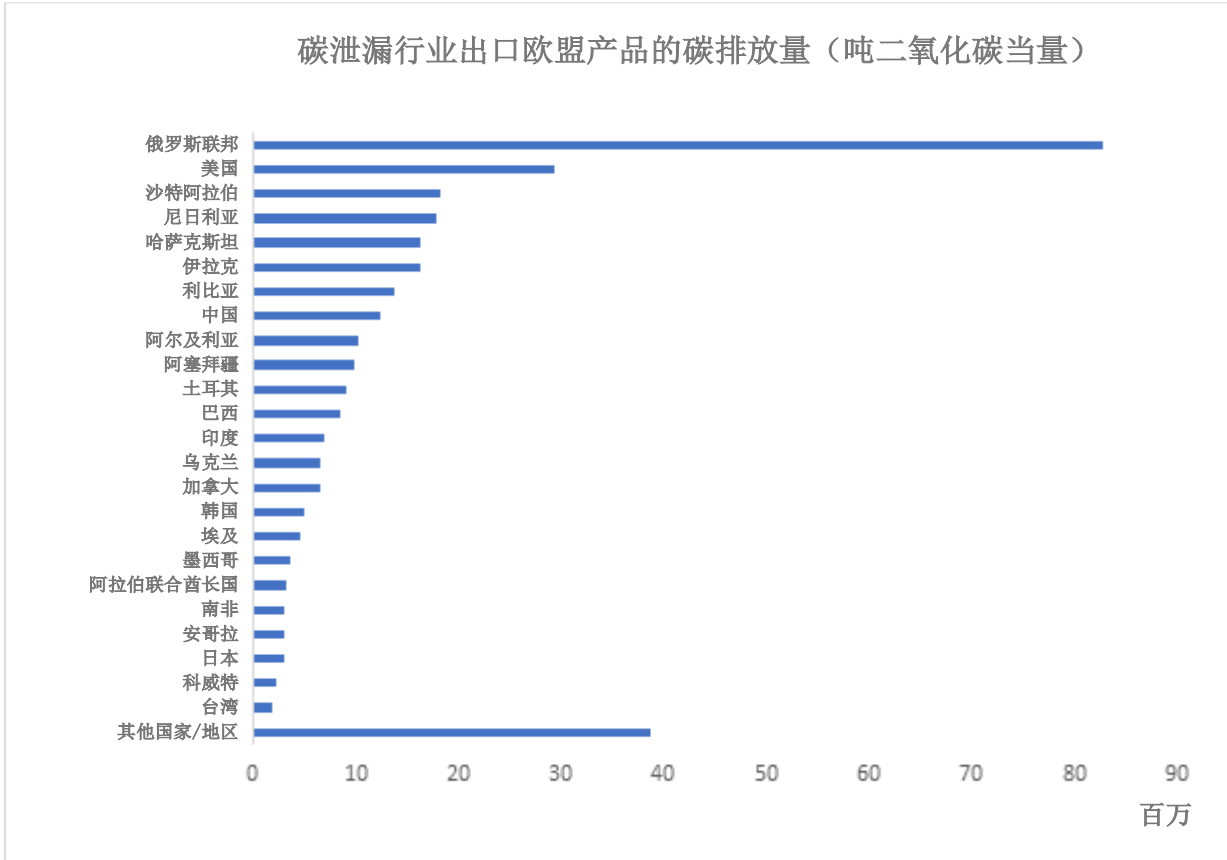
数据来源: 气候政策议组织 (CPI)

3. 关于提升绿色金融体系和吸引国际投资者的政策建议

a. 碳关税：建立全球公平环境的可能途径

全球各国的私营机构及政府均强调需要创造公平的环境来推动绿色转型。否则，率先采取行动的国家和企业有可能会受到惩罚并导致适得其反的结果（例如：碳泄漏）。各国的气候政策需制定严格的碳排放价格（无论碳排放在哪里发生），并逐步停止化石燃料补贴。在这种情况下，以碳关税形式建立的碳边境调整机制（CBAM）预计会发挥重要作用，但是，要想确保公平过渡，需要向那些无力承担额外成本的国家和企业提供相应的支持。图 20 提供了各地区向欧盟出口的产品中所含碳排放量的估算值，其中中国排在第 8 位，而其前三大碳排放产品包括化工用品、药品和铝。

图 20：按国家或地区统计的对欧盟出口产品中所含的碳（以欧盟行业排放强度进行评估）



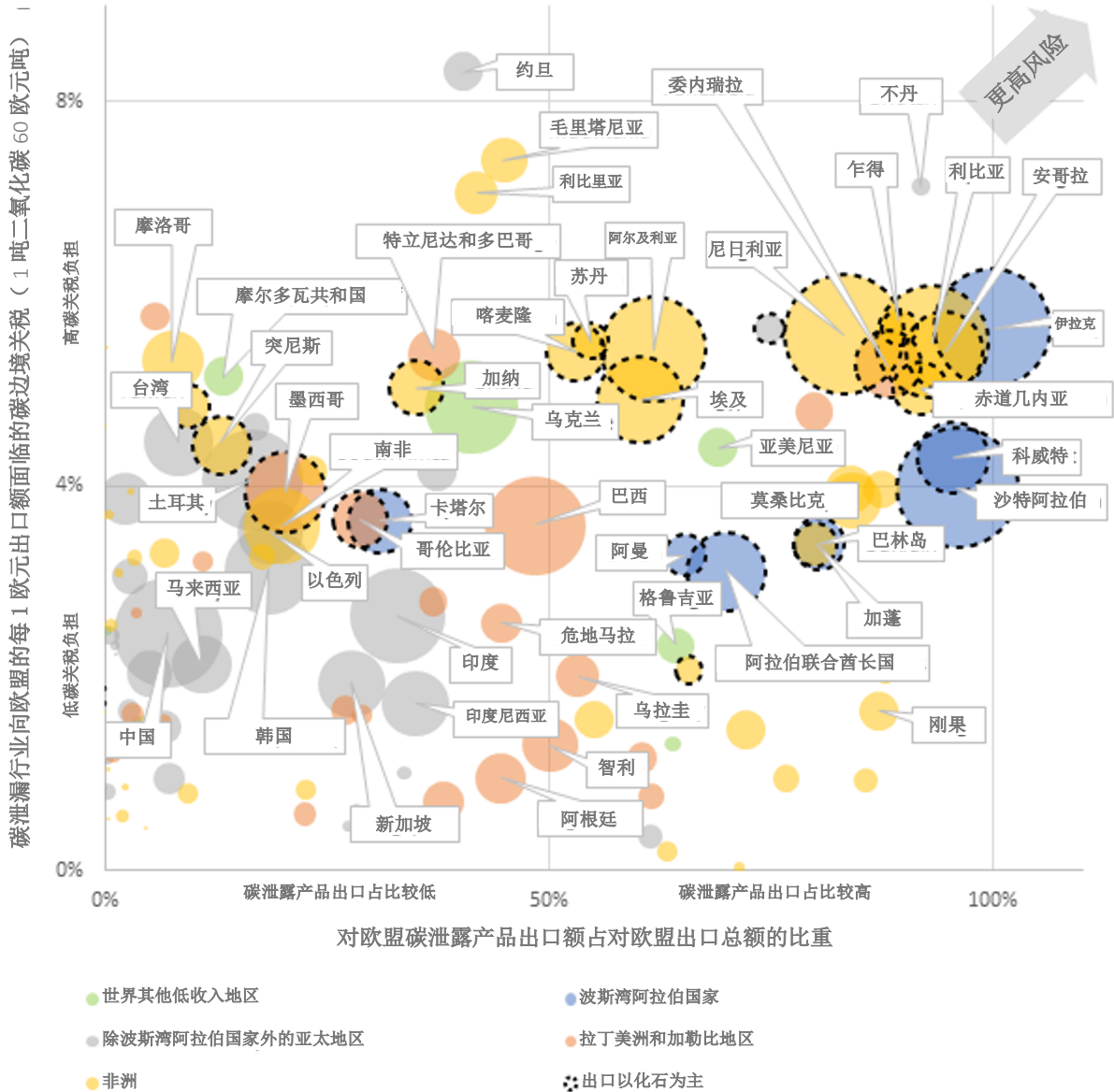
数据来源：安联集团经济研究部门

然而，各国在面临欧盟碳关税的相对风险敞口明显不同。如图 21 所示，图中上半部分的国家和地区可能会因碳泄漏或“棕色”出口行业而面临高额碳关税。气泡面积大小表示出口到欧盟的产品的相对碳含量。位于该图的左半部分的国家和地区，其向欧盟出口的产品中仅有一小部分将面临征收碳关税，而在右半部分的国家和地区，其大部分出口额来自“棕色”行业。

欧盟委员会在有关欧盟碳边界调整机制（CBAM）的意见征询程序中发表声明，称可以考虑以双边二氧化碳定价承诺和机制替代欧洲碳边界调整机制相关的关税¹⁶。这清晰表明实施严格气候政策的国家可以通过双边协议的方式免除其出口欧盟所面临的碳关税。

图 21：发展中国家和欠发达国家出口欧盟面临的碳关税，按每吨二氧化碳 60 欧元的价格估算，以欧盟行业碳排放密度为基础制定碳泄漏清单（气泡大小与出口欧盟产品二氧化碳排放量的平方根成比例）

¹⁶ 在欧盟委员会碳边界调整机制磋商过程中,不同利益相关者在不同场合均强调了利用双边二氧化碳定价承诺和机制替代 EU CBAM 相关关税的可能性。了解更多详情, 请查看欧盟委员会碳边界调整机制倡议网站, 特别是法国政府的反馈: <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12228-Carbon-Border-Adjustment-Mechanism>



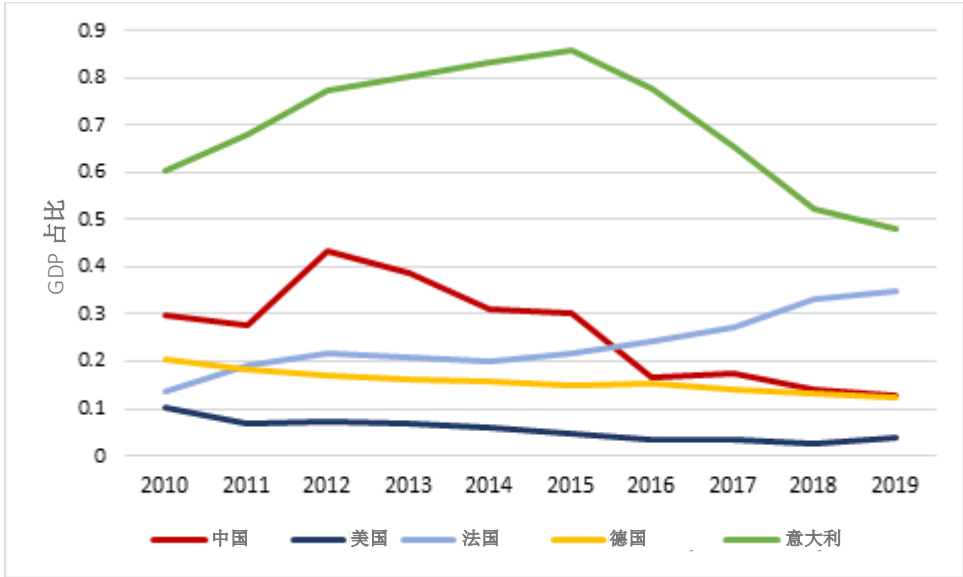
数据来源：安联集团经济研究部门

b. 完善监管框架为吸引国际投资者

i. 终止化石燃料补贴

终止化石燃料补贴与提供绿色技术补贴同样重要，但却常常不被重视。化石燃料补贴将导致资源配置效率低下、能源相对价格出现扭曲，低碳能源企业价格失去竞争力，从而阻碍可持续经济发展和气候行动的进程。在最坏的情况下，可导致经济的严重僵尸化。对比各国/地区的化石燃料补贴并非易事，因为各国/地区对于“补贴”的定义尚未达成一致。我们在此使用经济合作与发展组织（OECD）提出的化石燃料补贴定义，该定义包含了直接财政预算转移和基于库存估算的税收支出。图 22 显示了中国、美国及欧盟三个大国（德国、法国和意大利）的化石燃料补贴占当年国民生产总值（GDP）的比例。中国和美国化石燃料补贴在 GDP 的占比自 2010 年以来一直呈下降趋势。但截至 2019 年底，中国的相对化石燃料补贴仍高于美国。欧盟的发展亦不太乐观，不仅补贴的相对水平明显偏高，其发展趋势也令人担忧。即使在补贴程度最低的法国，化石燃料补贴在 GDP 的占比仍增加了三倍。

图 22：化石燃料补贴



图表来源：安联集团经济研究部门，数据来源：经济合作与发展组织（OECD）

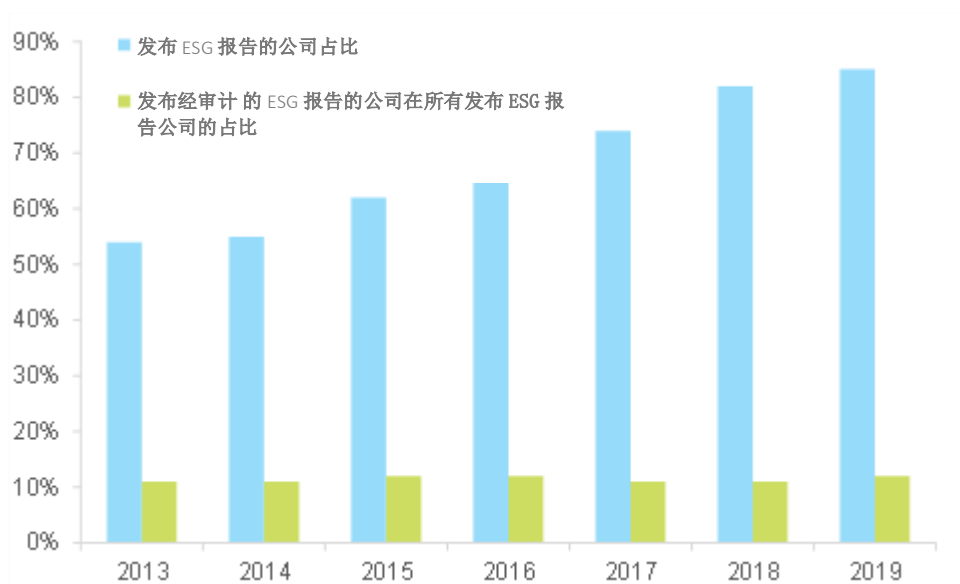
减少化石燃料补贴不仅能够降低经济僵尸化风险，而且可以保证将财政资源用于绿色转型以获得更高的生产效率。这不但有利于促进 GDP 的持续增长，同时也将相应地增加就业岗位，特别是对能力有更高要求的就业岗位。

- ii. 强制及统一的公司环境、社会及公司治理（英文为 Environment, Social and Governance, 简称 ESG）报告

促进绿色金融的发展需要大幅提高信息的可用性。如果没有强大的追踪和影响分析报告标准，很难确保有效地将资金投入对气候变化影响最大的项目中。目前，绿色金融政策仅提出了一些关键汇总指标，各机构可以采用自己的方法披露这些汇总指标。确保在事后对项目的气候影响进行评估报告，并按投资者在该项目的持股比例进行影响力分配，这种方法将有助于改进影响力追踪评估模型，避免重复计算。强制的气候报告也是吸引国际资本流入的关键。

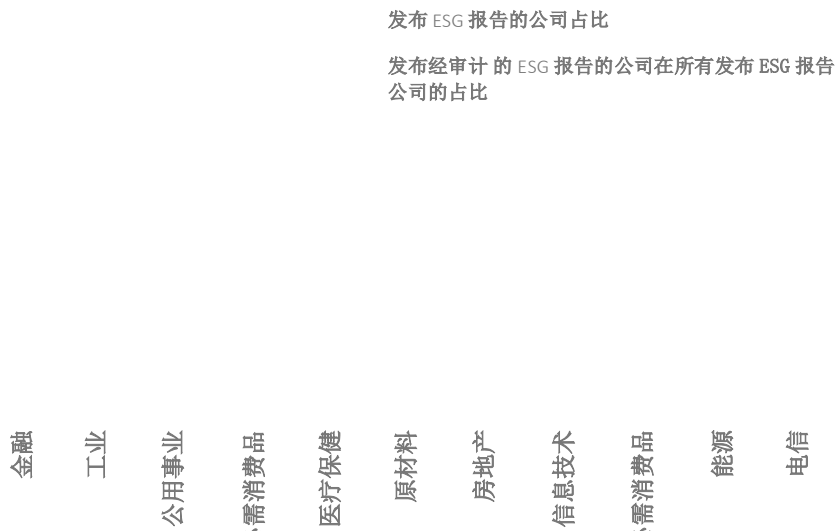
在中国，越来越多的上市公司开始披露 ESG 绩效数据，这将有助于促进 ESG 主题投资的增长。然而，在这些公司中，对 ESG 披露信息进行审计的公司占比很低，这表明披露数据质量仍有很大的提升空间。此外，在 ESG 披露的范围和质量方面，中国企业仍落后于全球水平。例如，沪深 300 成分股公司的彭博 ESG 信息披露平均得分在主要股市指数成分股公司中排名最低（即与 ASX200 指数、恒生指数、日经 225 指数、标准普尔 500 指数、富时 100 指数和 KOSPI 200 指数相比）。

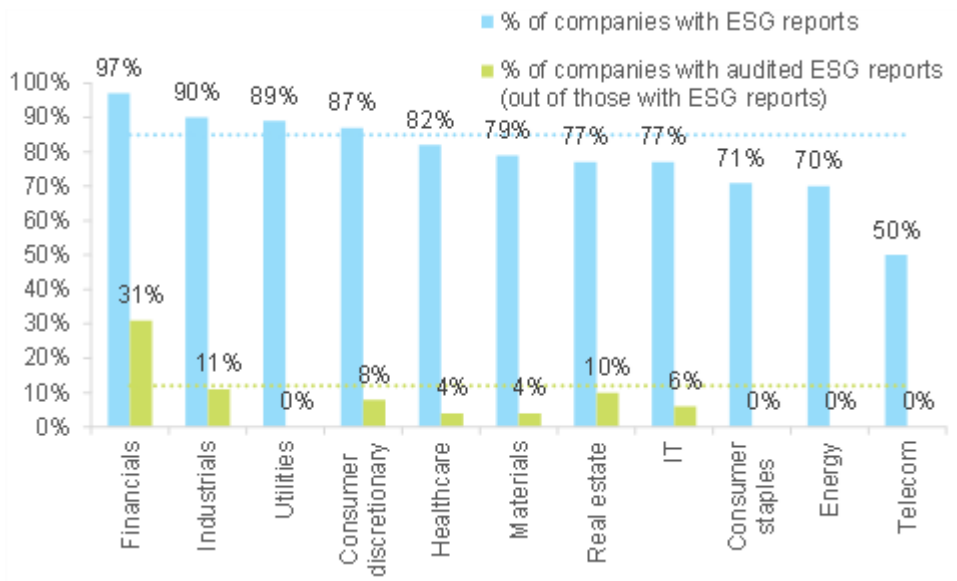
图 23：沪深 300 指数成分股公司的 ESG 信息披露比例



数据来源：万得、平安数字经济研究中心

图 24：按行业统计的 2019 年沪深 300 成分股公司的 ESG 信息披露比例





数据来源：万得、平安数字经济研究中心

中国监管机构原计划要求上市公司在 2020 年底进行 ESG 信息披露，但由于新冠肺炎疫情的影响，这一要求被推迟至 2021 年实施。此外，外国投资者在投资中国资产时必须符合其基金注册地的 ESG 标准要求，这将有助于提高中国公司的报告水平。中国证券监督管理委员会即将要求上市公司必须进行环境信息披露，这将有助于加强跟踪和监控。该政策将要求公司对其气候金融情况进行报告，目前监管机构正在就需要披露的具体指标征求意见。

为更好地指导公司提高披露质量和数据可比性，监管机构应制定统一的指导意见，集中最重要的一系列指标。监管机构制定的指导意见应参考相关权威国际组织的标准（例如：全球报告倡议组织（GRI）和世界经济论坛“利益相关者资本主义披露准则”），并充分考虑中国企业的具体情况。监管机构还应鼓励企业对其 ESG 披露信息进行审计。改善 ESG 信息披露和绩效将有助于提高中国企业在全球资本市场的信誉和价值。

随着《欧盟可持续金融分类方案》、《非财务报告指令》（NFRD）的推出，以及可持续发展议题纳入《可持续金融披露指令》（SFDR）、《欧洲金融工具市场指令》（MiFID II）和保险市场监管体系（欧洲偿付能力二代），欧盟在信息披露的必要数量方面越来越完善。2021 年 3 月起，欧盟企业将开始按相关指令披露 ESG 关键绩效指标。预计未来几年内 ESG 信息披露将持续扩展和深化，促进欧盟企业内部报告体系不断完善，并将推动 ESG 数据和相关服务的蓬勃发展。

2020 年 2 月 25 日，德国政府可持续金融咨询委员会（Sustainable Finance Beirat）公布了将可持续发展标准纳入金融产品的建议。该建议旨在将金融投资的 ESG 绩效披露透明化，从而将投资资金从 ESG 绩效低下

的企业流向绩效优异的企业。金融市场趋势表明，尽管这一做法在过去收效并不明显，但在不久的将来将对市场产生重大影响。德国可持续金融咨询委员会建议对所有金融产品（不仅包括可持续金融产品）采用以下关键绩效指标（KPI），这些 KPI 应通过简单、充分且适当的汇总指标进行表述（例如：零售金融产品的颜色代码）。

图 25：金融产品的 ESG 关键绩效指标

维度	类别	可能采用的 关键绩效指标（KPI）*
环境	气候变化	根据全球统一标准提供范围一、二、三的温室气体排放信息
	能源管理	按不可再生能源和可再生能源（包括电、热和一次能源消耗）统计的总能耗
	水资源管理	淡水总抽取量和总消耗量，及其在基线水压力高或极高地区中的百分比
	废弃物与污染	废弃物总量，回收百分比 空气污染物排放（氮化物、硫化物和颗粒物（PM））

	生态影响/生物多样性	在保护区和保护区以外生物多样性价值高的地区（及这些区域附近）自有、租赁、管理的经营场所清单
	循环经济	用于制造企业主要产品和服务的原材料回收的百分比
	环境供应链管理	实行环境影响评估的供应商数量和占比 实行环境影响评估的采购量的占比
社会	劳动力	<p>劳资协定涵盖的在职劳动力百分比</p> <p>员工流失率</p> <p>按性别统计的标准入门工资与当地最低工资的比率</p> <p>按性别和员工类别统计的每人平均培训时数</p> <p>长期（无固定期限）和定期（临时）合同的员工细分</p> <p>直接雇佣和非直接雇佣劳动力的细分（包</p>

		括临时机构雇员、现场承包商、自由职业者)
	员工健康与安全	工伤死亡和事故总数和比率
	多样性与机会均等	按年龄组、性别和其他多样性指标统计的每个员工类别的员工百分比
	人权	按国家统计的接受人权审查或人权影响评估的业务总数和百分比
	社会供应链管理	实行社会影响评估的供应商数量、占比 实行社会影响评估的采购量的占比
	税务	支付的总税额（按国家统计）
	客户隐私和网络安全	数据泄露数量和受影响人数
	其他类别，包括社区关系、公共政策、产品安全、负责任营销等	
治理	商业道德	接受反腐败培训的员工总数和百分比

	可持续公司治理	负责经济、环境和社会议题决策的委员会名单以及每个委员会中独立委员的百分比
	薪酬	最高治理机构和高级管理人员的薪酬政策，包括对 ESG 绩效标准的考量及其对不同类型薪酬的影响
	其他类别，包括竞争行为、负责任投资机会等	
*上述 KPI 仅作为各项分类表述的建议，其他表述方式也可能适用。		

数据来源：德国政府可持续金融顾问委员会

对于 ESG 风险评估以及对金融产品和投资所含资产在交付过程中的 ESG 评估，国家层面的 ESG 评级将发挥重要作用。因此，可以从目前的国家 ESG 评级指数中洞察到各国吸引投资的竞争力。虽然现有评级对环境方面的指标进行了广泛充分的探讨，但在社会和治理方面制定适当的指标却并非易事。被国际社会广泛使用的“社会进步指数”的相关指标可以为我们提供很好的参考。该指数使用 51 个社会和环境指标、从三个方面衡量一个国家的社会

进步程度：基本人类需求¹⁷、幸福福祉¹⁸和机会¹⁹。过去几年，中国在前两个领域取得了重大进展，其指数得分高于全球平均水平。然而在机会方面，中国仍需进一步提升，以吸引更多的国际投资者。

iii. 深化资本市场与金融开放

中国政府于 2020 年 10 月发布《关于促进应对气候变化投融资的指导意见》，旨在加强中国与国外金融机构在气候金融领域的合作，支持境内符合条件的绿色金融资产跨境转让，允许其在离岸市场进行交易。国内金融机构还将实现到境外进行气候融资，其途径包括在海外设立人民币绿色投资基金和绿色信贷基金。鼓励外国金融机构在中国发行绿色债券，更多投资和持有国内绿色金融资产，并使用人民币作为相关活动的跨境结算货币。

在 2017–2018 年期间，境内气候投资资金中仅有 90 亿元人民币（约合 13.4 亿美元）来自国外私人资本²⁰，而国内气候投资资金则达到 2.1 万亿

¹⁷ 营养、基本医疗、水、卫生、住所和人身安全。

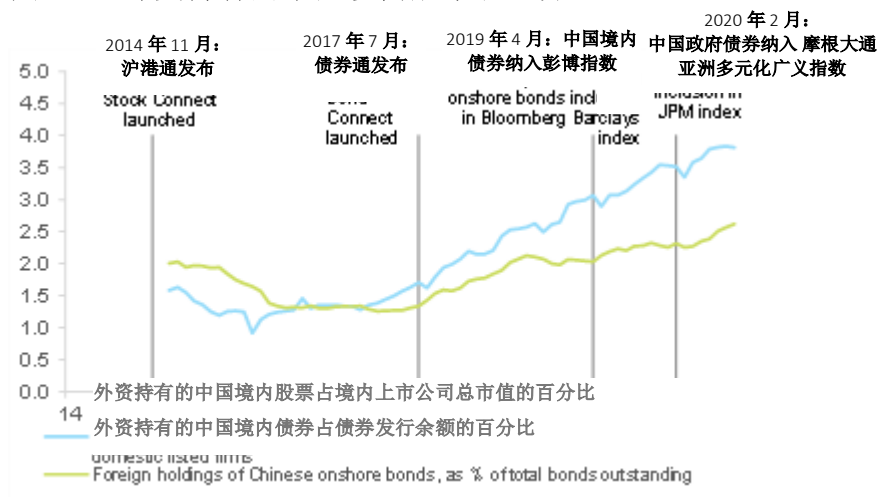
¹⁸ 获得基本知识、信息和通信、健康、幸福和优质环境。

¹⁹ 个人权利、个人自由和选择、包容性和接受高等教育的机会。

²⁰ 《中国扩大气候金融规模的潜力》（The potential for scaling climate finance in China），气候政策倡议（2021）

元人民币（约合 3200 亿美元）。从这一占比可以看出，虽然中国正在逐步实现金融开放，但在资本账户方面仍相对封闭。事实上，当前外资持有中国境内股票和债券的比例已达到 4% 和 2.5%（见图 26）。在 2015-2016 年期间，国际投资者对于人民币和中国市场尚有顾虑，此后随着中国采取一系列措施不断开放资本市场，外资投资中国资本市场的比例自 2017 年以来逐年上升。中国将继续以谨慎有序的方式放宽准入限制。

图 26： 外资持有的中国境内股票和证券



数据来源：中国人民银行、证监会、安联集团经济研究部门

实际上，进一步实现金融市场开放和人民币国际化是中国双循环战略的重要组成部分。这些金融改革是基于当前中国在全球经济和供应链中的核心作用、

中国消费者日益提升的市场影响力、及中国在全球金融稳定²¹、支付和货币政策中承担的越来越重要的角色。相较中国经济的总体规模，人民币在国际市场使用的份额仍然偏低。在国际交易方面，根据 环球同业银行金融电讯协会（SWIFT） 的数据，截至 2020 年 9 月，人民币交易占比仅为 1.97%。在全球外汇储备方面，2020 年第 3 季度，以人民币计价的资产占比为 2.1%。考虑到人民币资产在 2016 年第 4 季度才开始被纳入外汇储备（即人民币被纳入国际货币基金组织特别提款权货币篮子），这一增长是令人瞩目的。目前全球外汇储备中人民币的占比已高于加元、澳元和瑞士法郎（分别为 2.0%、1.7% 和 0.2%），但仍远低于美元和欧元。

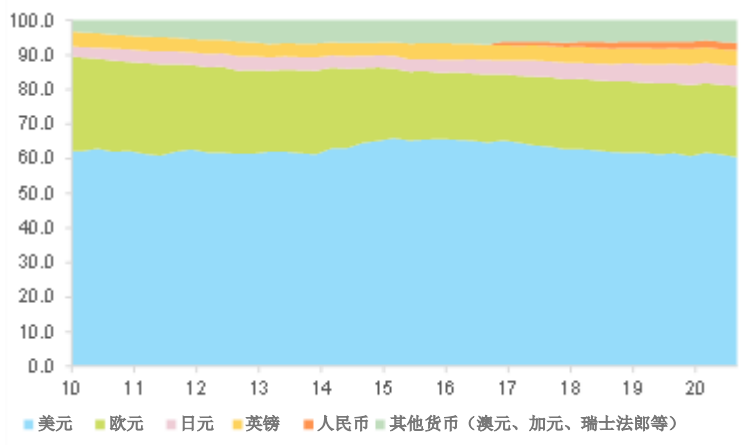
图 27：中国跨境贸易人民币结算占中国贸易总额的百分比



²¹ 过去，逐步实现的金融自由化已导致高收入国家（如澳大利亚或加拿大）的资产价格出现上涨。

数据来源：中国人民银行、中国国家外汇管理局、安联集团经济研究部门

图 28：按资产计价货币统计的全球外汇储备分布



数据来源：国际货币基金组织、安联集团经济研究部门

中国一直在循序渐进地推动金融市场开放进程。过去的经验表明，中国应当继续坚持开放方针，包括：进一步改善国内金融行业环境，使金融机构以可预见的方式对金融风险进行评估、监控和防范；提升金融素养；强调市场作用，规避道德风险，完善资产负债管理。最后，我们认为可持续的金融开放需要审慎地开放金融技术创新，例如：人工智能和大数据分析、新的借贷和支付方式。

近年中国采取的金融市场开放措施包括放宽或取消境内金融企业的外资持股限制。此外，中国和欧盟于 2020 年底达成的中欧投资协定将逐步取消对金融服务业企业的合资要求（使欧盟与美国处于同等地位）。这些行动也可以促进中国政府和企业绿色金融领域展开全球合作，并吸引外国投资者加大对中国绿色转型的支持力度。

c. 国际倡议和全球合作

金融行业（尤其是资产所有者）是推动绿色转型的加速器。随着人口结构的变化，投资可再生能源和其他基础设施项目可以带来双赢的局面：在低利率时代，机构投资者正在为养老基金寻找可盈利的、可靠的长期投资机会。另一方面，绿色经济转型也需要长期资金。两者的结合将同时造福于气候和世界人口。

私人资本可以在可持续金融全球合作方面发挥巨大影响力。通过合作可以将资金规模从数十亿扩大到数万亿。2019 年 10 月，欧盟和中国以及其他六个国家（阿根廷、加拿大、智利、肯尼亚、印度和摩洛哥）启动了可持续金融国际平台（IPSF），这是加强未来可持续金融合作的典型案例。IPSF 的

最终目标是加大私人资本对环境可持续发展及绿色转型的投资。自该平台启动以来，印度尼西亚、新西兰、挪威、塞内加尔、新加坡和瑞士等其他国家也加入了这一倡议。目前，成员国的温室气体排放量占全球总量的 50%，人口占世界人口的 50%，GDP 占全球 GDP 的 45%。因此，IPSF 提供了一个政府间多边对话平台，促进各成员国制定可持续金融监管政策，帮助投资者发现和把握可持续投资机会，真正推动气候及环境目标的实现。通过 IPSE，成员国可以在尊重国家和区域差异的前提下相互交流和传播信息、推广最佳实践、对比各自的政策优劣、发现可持续金融推行过程中的壁垒和机会。

资产所有者是实现零碳经济的关键

同样，机构投资者也应加强合作、支持环境保护。2019 年 9 月，**联合国发起成立了“净零资产所有者联盟”**（Net-Zero Asset Owner Alliance）。这个联盟的 12 个创始成员机构中包括全球最大的保险公司（例如：安联保险集团）。该联盟管理的总资产在成立一年内翻了一番，目前总资产规模超过 5.5 万亿美元，涵盖了 34 家全球最大的养老基金、保险公司和主权财富基金。这是一个机构投资者在加强气候保护领域加强合作、为零碳经济转型

提供资金的典型案例。该联盟成员是首批对外宣布 2025 年碳减排目标的私人金融机构，被联合国秘书长安东尼奥·古特雷斯（António Guterres）称为碳中和承诺的“黄金标准”。净零资产所有者联盟成员具体承诺如下：

- 投资组合碳减排目标：到 2050 年最终实现联盟成员投资组合的温室气体净零排放，并设定未来五年内的碳减排目标。根据《2025 年目标设定议定书》，该联盟承诺到 2025 年将温室气体排放量减少 16% 至 29%（较 2019 年基准线）。
- 主要关注碳减排难度较大、转型困难的行业。
- 为绿色转型提供资金：该联盟的集合机制便于志同道合的机构投资者为新兴技术提供资金，并建立混合融资和公私联营结构，从而在更广的市场范围产生积极的溢出效应和信号效应。
- 该联盟的资产所有者积极与债券发行机构、资产管理机构和政府开展合作，支持绿色转型。该联盟完全遵照联合国政府间气候变化专门委员会（IPCC）评定的现有最佳气候科学，并与民间组织开展广泛合作。
- 该联盟发表了一系列关于强制性信息披露、逐步淘汰热能煤、新冠肺炎疫情之后的绿色复苏之路等方面的意见书。

上述的国际合作组织和联盟对中国金融市场的参与者和资产所有者也具有重要意义，并可为中国的气候目标做出积极贡献。净零资产所有者联盟可为中国资产所有者提供适当的分析工具和方法，以管理与气候相关的风险。该联盟聚焦于气候投资，推动绿色金融成为中国金融市场的主流，并支持中国最终实现碳中和的宏伟目标。

附录：后疫情时代全球复苏的“绿色”程度如何？

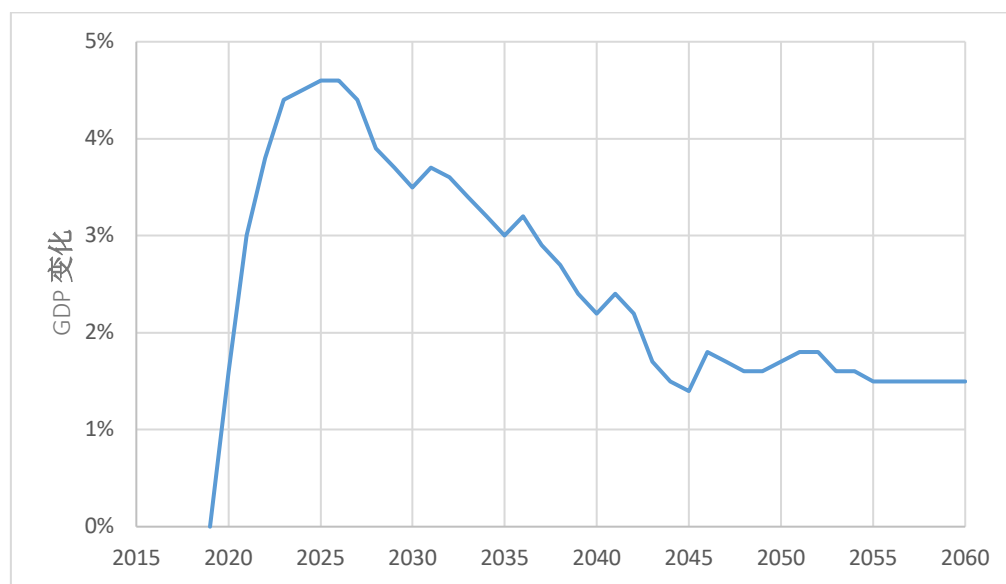
新冠肺炎疫情后的经济重建为全球加速实现碳中和提供了一个历史性机遇。随着短期救援计划向长期复苏计划转变，气候领域的关注点也应当转移到长期气候效益上。中国和欧盟似乎已准备好大力推动气候友好型投资以促进经济增长。但是，这也使依赖化石能源的资产面临风险。

在 2020 年 9 月 22 日召开的联合国大会上，中国国家主席习近平宣布中国将努力争取 2060 年前实现碳中和。这个目标的实现不仅有助于解决全球气候问题（可使全球平均气温上升幅度降低 0.25°C）和增强中国的软实力，同时也会带来切实的经济效益。根据英国剑桥计量经济学会的分析²²，实现上述目标将对中国国民生产总值产生积极的总体净影响。其他行业的投资活动将产生积极的溢出效应，促进技术进步及提升中国在绿色技术的领先地位，

²² <https://www.carbonbrief.org/analysis-going-carbon-neutral-by-2060-will-make-china-richer>

减少化石燃料进口总额并提高自给自足比例，从而促进国内市场发展。因此，在英国剑桥计量经济学会的分析中，中国国民生产总值在碳中和情景下可能增长近 5%，如图 29 所示。但是，在当前阶段，中国还没有明确实现 2060 年新气候目标所采取的政策措施。为了实现潜在的增长前景，建议中国对经济恢复政策进行适当的调整，提高绿色转型投资的目标。

图 29：到 2060 年达到碳中和将推动中国 GDP 的增长（中国 GDP 在实现碳中和过程中相对 2019 基准线的变化趋势）



数据来源：英国剑桥计量经济学会基于 www.carbonbrief.org 的模型

如前文图 10 所展示的研究发现，相比中国，美国和欧盟推出的疫情后财政刺激政策更强调绿色转型。绿色转型部分占欧盟整体财政刺激政策的 20%。拜登上任前的绿色转型承诺仅占美国财政刺激计划的 1% 左右，但是美国政府发布的最新计划将绿色转型刺激计划金额提高至 2 万亿美元以上，这在美国总体财政刺激计划中占比达到 30% 以上。相比之下，在 2008-2009 年期间，美国将经济刺激计划中的 12% 用于绿色转型措施。根据中国政府此前公布的疫情后财政刺激计划，我们估算其中的绿色转型部分占比不到 5%。

展望未来，绿色是构建更均衡、更具包容性的经济体的不可或缺的要素。中国致力于在 2025 年之前实施新基建计划，重点关注尖端技术、数字化基础设施和电动出行项目（例如：充电桩基础设施和公共交通）。与上一个五年规划相比，国务院制定的十四五规划纲要中并没有提高中期气候目标。中国提出未来五年内将碳强降低和能源强度分别降低 18% 和 13.5%。只有在实施双速的方式下，才有可能达到 2060 年实现碳中和。为了将全球升温幅度控制在 1.5°C 以下，并降低对当地环境的污染影响，提前达到碳排放峰值是可以考虑的。随着绿色技术成本的大幅下降，推迟实现碳排放峰值可能会降低转型成本，但进入市场时间过晚也会带来错失领先技术的风险。此外，十四五规划纲要还提出了到 2025 年基本消除空气重污染、清理河流、恢复湿地，及森林覆盖率提高到 24% 的目标。

参考文献

Caldecott, B、Kruitwagen, L.、Dericks, G.、Daniel J.、Tulloch.、Kok, I.、Mitchell J.。《闲置资产与热能煤环境相关风险敞口的分析》(Stranded Assets and Thermal Coal An analysis of environment-related risk exposure), 闲置资产计划, SSEE, 牛津大学, 2016 年 1 月。

《中国环境与发展国际合作委员会》(China Council for International Cooperation on Environment and Development), 2015《绿色金融改革与促进绿色转型研究》(Green Finance Reform and Green Transformation)。

气候债券倡议组织, 2020。《2019 年绿色债券全球市场状况报告》(Green Bonds Global State of the Market 2019 report) https://www.climatebonds.net/system/tdf/reports/cbi_sotm_2019_voll_04c_0.pdf?file=1&type=node&id=47577&force=0

气候政策倡议委员会，2021。《中国扩大气候金融规模的潜力》(The Potential for Scaling Climate Finance in China)。

CUI Yujun 等人，2018。《绿色贷款对中国信用风险的影响》(The Impact of Green Lending on Credit Risk in China)。

de Coninck, H.、A. Revi, M. Babiker、P. Bertoldi、M. Buckeridge、A. Cartwright、W. Dong、J. Ford、S. Fuss、J.-C. Hourcade、D. Ley、R. Mechler、P. Newman、A. Revokatova、S. Schultz、L. Steg 和 T. Sugiyama, 2018: 《加强和执行全球对策》(Strengthening and Implementing the Global Response)。收录于: 全球变暖 1.5° C。此为政府间气候变化专门委员会该报告为在加强全球应对气候变化威胁、可持续发展和努力消除贫穷的背景下, 针对比工业化前全球温度升高 1.5° C 的影响和相关的全球温室气体排放途径做出的报告【Masson-Delmotte, V.、P. Zhai、H.-O. Pörtner、D. Roberts、J. Skea、P.R. Shukla、A. Pirani、W. Moufouma-Okia、C. Péan、R. Pidcock、S. Connors、J.B.R. Matthews、Y. Chen、X. Zhou、M. I. Gomis、E. Lonnoy、T. Maycock、M. Tignor 和 T. Waterfield (编者)】。待刊。

欧洲投资银行 (2021)。《2020/2021 年投资报告 - 在新冠肺炎疫情期间打造智能化的绿色欧洲》(Investment Report 2020/2021 - Building a smart and green Europe in the COVID-19 era)。

Gosens, J. 和 Jotzo, F. (2020), 《中国的疫情后经济刺激计划: 未见绿色新政》(China' s post-COVID-19 stimulus: no Green New Deal in sight)。2020 年 气候和能源中心工作文件, 2020 年 7 月。澳大利亚国立大学克劳福德公共政策学

院。 <https://ccep.crawford.anu.edu.au/publication/ccep-working-paper/17184/chinas-post-covid-19-stimulus-no-green-new-deal-sight>

绿色欧洲基金会, 2014。《变革资金: 绿色经济转型中的金融业, 分析和政策建议》(Money for Change: The financial sector in the green economic transformation, analyses and policy recommendations)。

国际能源署 (2020b)。《按地区统计的电动汽车和储能锂离子电池产能及相关年度投资》(Commissioned EV and energy storage lithium-ion battery cell production capacity by region, and associated annual investment), 2010-2022, IEA, 巴黎 <https://www.iea.org/data-and-statistics/charts/commissioned-ev-and-energy-storage-lithium-ion-battery-cell-production-capacity-by-region-and-associated-annual-investment-2010-2022>。

国际可再生能源署 (2020)。《全球可再生能源展望：2050 年能源转型》(Global Renewables Outlook: Energy transformation 2050)。ISBN: 978-92-9260-238-3 <https://www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020>。

气候变化与可持续发展研究院 (2020)。《中国长期低碳发展战略与转型路径研究》(Study on China's Long-Term Low Carbon Development Strategy and Transition Pathway), 清华大学气候变化与可持续发展研究院 (2020)。

Jaeger, Joel、Michael I. Westphal 和 Cory Park (2020)。《绿色刺激措施的经验教训：全球金融危机案例研究》(Lessons learned on green stimulus: Case studies from the global financial crisis)。

世界资源研究所工作文件 <https://wriorg.s3.amazonaws.com/s3fs-public/lessons-learned-on-green-stimulus-case-studies-from-the-global-financial-crisis.pdf>。

麦肯锡，2020。《后疫情时代的经济刺激政策如何同时创造就业和帮助应对气候变化》(How a post-pandemic stimulus can both create jobs and help the climate)。

Myllyvirta, Lauri、ZHANG Shuwei、SHEN Xinyi (2020)。《中国是否会在 21 世纪 20 年代新建数百座煤厂？》(Will China build hundreds of new coal plants in the 2020s?), Carbon Brief www.carbonbrief.org/analysis-will-china-build-hundreds-of-new-coal-plants-in-the-2020s。

国家应对气候变化战略研究和国际合作中心 (2019)。《中国实施 2030 年应对气候变化国家自主贡献的资金需求研究》(Financial needs in implementing China' s nationally determined contribution to address climate change by 2030)。

王, 2018。《绿色融资: 改革美国的绿色债券监管》(Financing Green: Reforming Green Bond Regulation In The United States), 12 Brook. J. Corp. Fin. & Com. L. 。

<https://brooklynworks.brooklaw.edu/bjcfcl/vol12/iss2/9>

世界资源研究所, Joel Jaeger (2020)。《大萧条为 COVID-19 绿色复苏带来的启示》(Lessons from the Great Recession for COVID-19 Green Recovery)。世界资源研究所 博客

<https://www.wri.org/blog/2020/11/coronavirus-green-stimulus-great-recession-lessons>。

Asset owners can turbocharge China's journey to carbon neutrality

Allianz

Oliver Bäte and Ludovic Subran²³

Executive Summary

China has made remarkable progress in its green transformation. China has seen the fastest decline in emission intensity over the past decade, in part by far outpacing the European Union and the United States when it comes to greening its energy supply. In fact, China's installed capacity for renewable energy grew by over +800% to 695GW at the end of 2018, from a mere 76GW in 2000. As a result, installed capacity in the US is now around one third of that in China, while the EU stands at two thirds. China is also racing ahead when it comes to electrifying its transport system and prioritizing forest policy to remove carbon dioxide from the atmosphere. But current policy projections suggest that greenhouse gas emissions in 2030 will still be more than double the level needed to comply with the Paris agreement (14,242 mega tonnes vs 6,452 mega tonnes).

The financial sector needs to step up to turbocharge the green transformation.

China's green finance sector is growing fast: outstanding green loans stand at over

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RMB10.6trn (USD1.5tn), more than double the amount at the end of 2013; outstanding green bonds amount to RMB977bn (USD140bn), averaging +30% yearly growth since their introduction in 2016. Separately, China has also established hundreds of green funds, as well as opportunities for green stock indices and insurance. In total, an average RMB2.1tn was deployed per year on average in climate-related investments over 2017-2018. However, estimates of investment needs for China to reach its green targets in the coming decade(s) range from RMB3.33tn to RMB9.55tn on average per year. Green finance will thus need to step up significantly to bridge the funding gap.

Asset owners are instrumental to China's ambition of achieving carbon neutrality before 2060. Asset owners, as the ultimate responsible person for the investment portfolios, sometimes representative of the global / regional capital markets, have several levers to support carbon neutrality target while ensuring real world impact. Firstly, asset owners could engage with high-carbon companies on their decarbonization pathways. Secondly, they could advocate backing efforts to reduce the overall emissions intensity of high priority hard-to-decarbonize sectors. Thirdly, asset owners could ramp up financing for climate-positive investments such as renewables, green buildings, sustainable forestry, and green hydrogen.

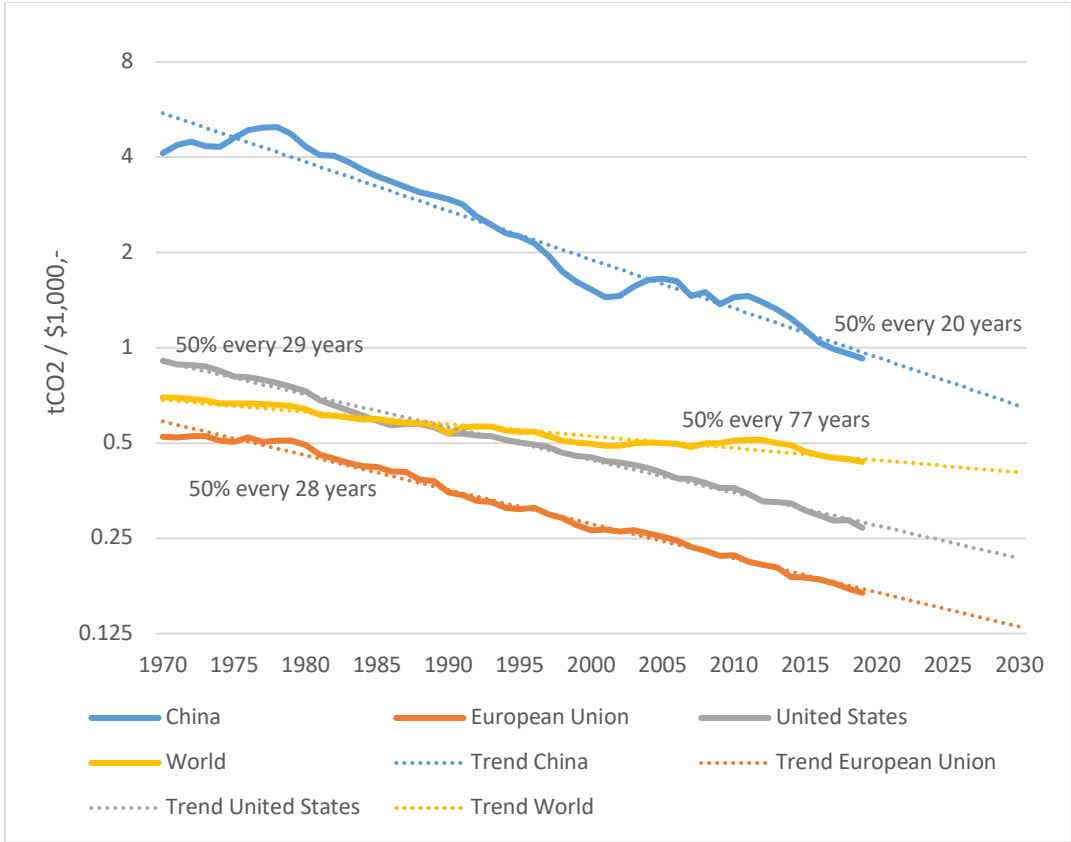
How could China's policymakers accommodate the growing appetite of international investors? International investors are willing to support China to

succeed with its goal of carbon neutrality by 2060. Of particular importance to investors are the following aspects: 1) A level-playing field, otherwise early movers get punished and incentives are wrong. Policy must put a stringent price on carbon and the phase-out of fossil fuel subsidies, including support for those who cannot bear the costs. 2) Mandatory climate reporting: regulators should develop unified guidelines and converge on a set of the most material indicators as today's practice of investors using their engagement with companies to get such information is not scalable and non-public information is not allowed to be used for investment decisions. 3) Gradual financial liberalization. Recent relaxation or cancellation of foreign ownership limits in financial sector firms based in China is supporting global cooperation in green finance, and helps attract foreign investors to support China's net-zero economy journey. Moreover, the UN convened Net-Zero Asset Owner Alliance – which combines 34 institutional investors, pension funds, insurers and state-owned funds, with asset under management of \$5.5 trillion delivering on a bold commitment to transition their investment portfolios to net-zero GHG emissions by 2050 – is a good example of how institutional investors can work together to enhance climate protection and finance the net-zero transition, which could also contribute to China's climate target with the participation of Chinese asset owners.

4. China's remarkable progress in its green transformation

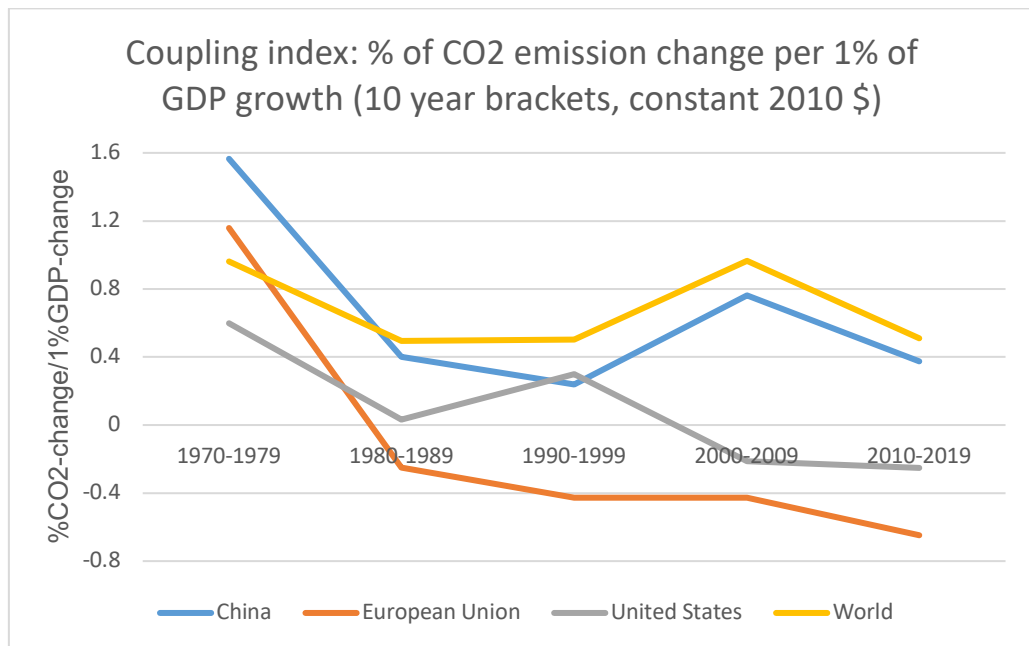
China, the EU (defined to include the UK) and the US accounted for almost half of all global greenhouse gas (GHG) emissions in 2018. However, over the past decade, all three have made considerable progress in decoupling economic growth from emission growth. Figure 1 shows that the CO₂ emissions required to generate a dollar of GDP has been steadily falling in all three economies, with China recording the fastest decline. While China started higher due to an economic structure tilted more towards manufacturing, it is now below 1 kg of emissions per dollar (in 2010 inflation adjusted value). The CO₂ emissions per dollar have halved every 20 years in China, though it required almost 30 years, or a generation, in the US and the EU. Keeping all trends constant, China will still need until 2140 to catch up with the US and until 2200 to catch up with the EU, though it would already catch up with the world average in 2050.

Figure 1: Emission intensity: CO₂ emissions per unit of GDP (kgCO₂/\$1,-GDP, logarithmic scale, in constant 2010 \$)



Source: Allianz, Data: World Bank (WDI) European Commission (EDGAR)

Figure 2: ‘Coupling index’ percentage change of emissions per one percent growth of GDP (10-year brackets, constant 2010 \$)

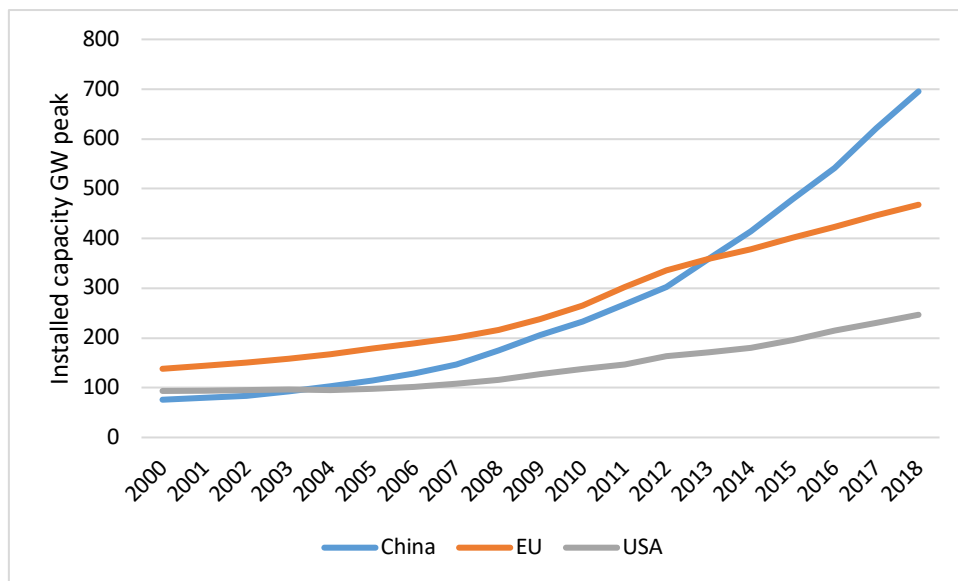


Source: European Commission Edgar, World Bank WDI

Besides the changing structure of the economies – from manufacturing to services – one decisive factor behind this decoupling is the **greening of energy supply**, and China is far outpacing the EU and the US in this regard. China’s installed capacity for renewable energy grew by over +800% to 695GW at the end of 2018, from a mere 76GW in 2000. Over the same period, the EU and the US observed growth of

“only” +230% and +160%, respectively. As a result, installed capacity in the US is now around one third of that in China, while the EU stands at two thirds. Back in 2000, all three economies were more or less at the same level (see Figure 3).

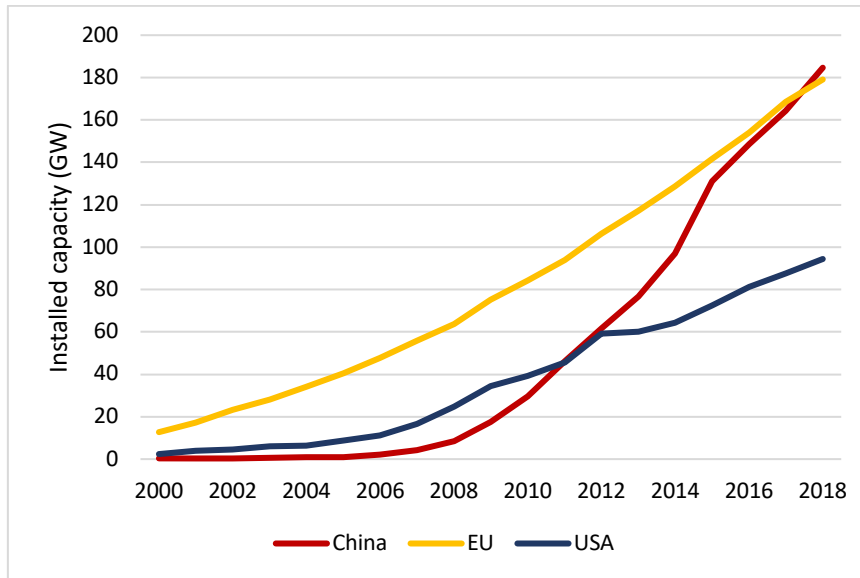
Figure 3: Total renewable energy: installed capacity



Source: Allianz Research, Data: OECD

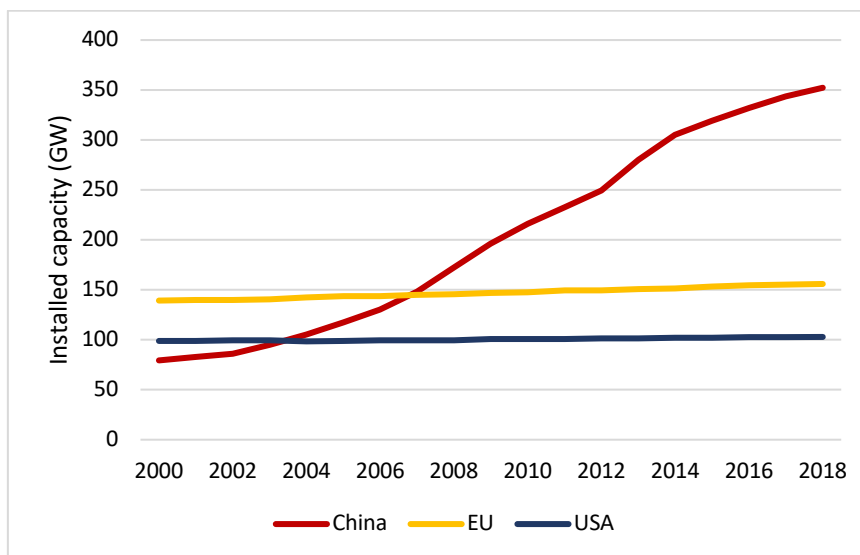
Looking at the subsectors, we can see that China overtook the EU in installed capacity for wind energy in 2017 (see Figure 4). Its hydro energy capacity has also risen by a whopping 300% to 352GW since 2000, while the EU and the US only recorded marginal increases (see Figure 5). And China also dwarfs the EU and the US in solar power capacity, with 175GW, compared to 117GW and 53GW, respectively (see Figure 6).

Figure 4: Wind energy: installed capacity



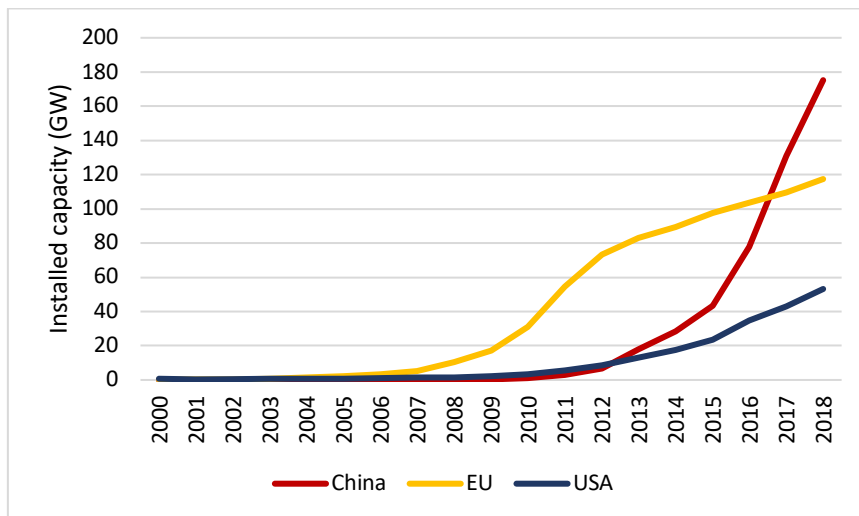
Source: Allianz Research, Data: IRENA

Figure 5: Hydro energy: installed capacity



Source: Allianz Research, Data: IRENA

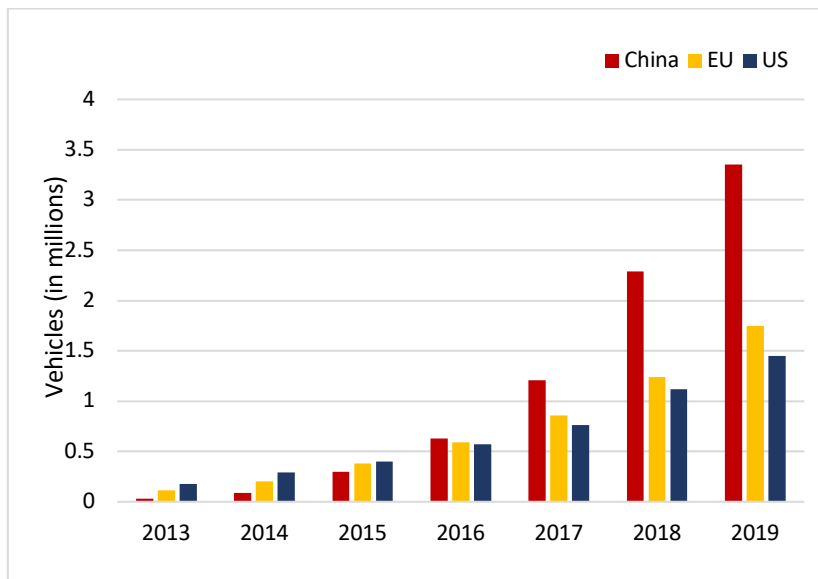
Figure 6: Solar energy: installed capacity



Source: Allianz Research, Data: IRENA

As transportation accounts for one fourth to one fifth of all GHG emissions (based on well-to-wheel emissions), the shift to electric vehicles is especially important for reaching the Paris climate goals. In this regard, China is also racing ahead when it comes to **electrifying its transport system**: At the end of 2019, China had an EV stock of 3.35mn, a more than +50% increase from 2018 (2.29mn). In comparison, the EU and the US recorded 1.75mn and 1.45mn EVs in 2019, respectively (see Figure 7).

Figure 7: EV Stock



Source: Allianz Research, Data: IEA

Specific and ambitious policies that explicitly address the **removal of carbon dioxide** from the atmosphere will also play an important role in achieving the Paris

Climate goals. Negative emissions technologies and solutions such as afforestation/reforestation and bioenergy with carbon capture and storage (BECCS) are prominent means to remove carbon emissions from the atmosphere. Out of the three countries, China has by far the most ambitious forest policy, despite having the lowest forest coverage (22% vs 34% in the US and 40% in the EU (2016)). China's Natural Forest Conservation Program is the largest forest conservation program in the world and includes massive tree-planting programs, an expansion of forest reserves and a ban on logging in primary forests. The Chinese government spends heavily on these forest programs—more than either the US or the EU and more than three times the global average per hectare²⁴. After planting more than 7 million hectares of forest per year between 2016-2018²⁵, the country has set a 2035 forest coverage target of 26%.

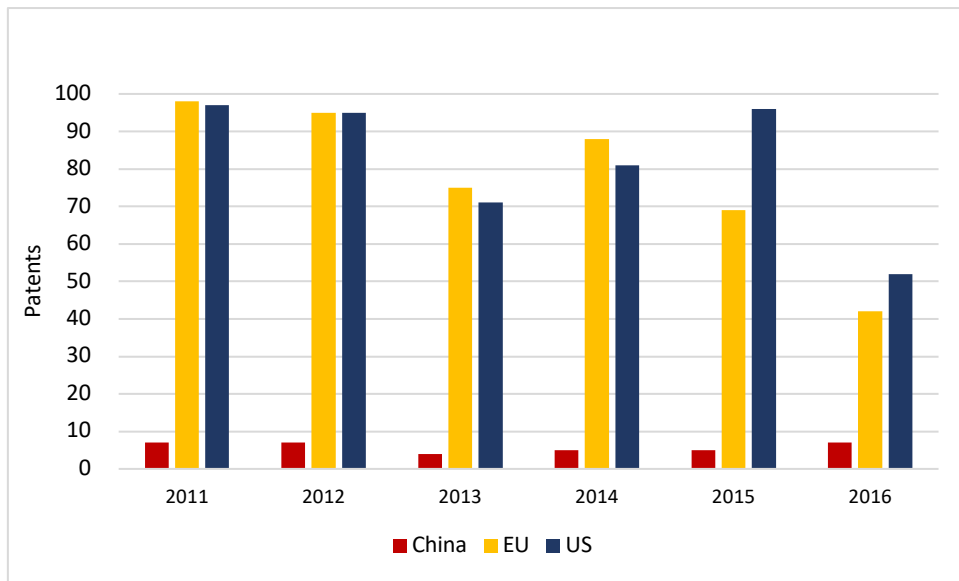
Carbon Capture with Storage technology (CCS) seems to be the one field in which the EU and the US appear to be leading. These technologies involve capturing carbon emissions and storing them, rather than releasing them back into the atmosphere. A comparative analysis of the reserve capacity of CCS is rather difficult due to the lack of adequate data and a standardised measure for comparison.

²⁴ Sandalow, 2019

²⁵ NDRC, *China's Policies and Actions for Addressing Climate Change* (October 2016) at p.20; NDRC, *China's Policies and Actions for Addressing Climate Change* (October 2017) at p.15; NDRC, *China's Policies and Actions for Addressing Climate Change* (November 2018) at p.16. See also National Bureau of Statistics, *Statistical Bulletin on National Economic and Social Development in 2018* (February 28, 2019) at Part XII; National Bureau of Statistics, *Statistical Bulletin on National Economic and Social Development in 2017* (February 28, 2018) at Part XII.

However, the development of CCS-related patents are suggestive of the potential. Figure 8 shows that the EU and the US have significantly higher CCS patent issuances than China.

Figure 8: New CCS Patents

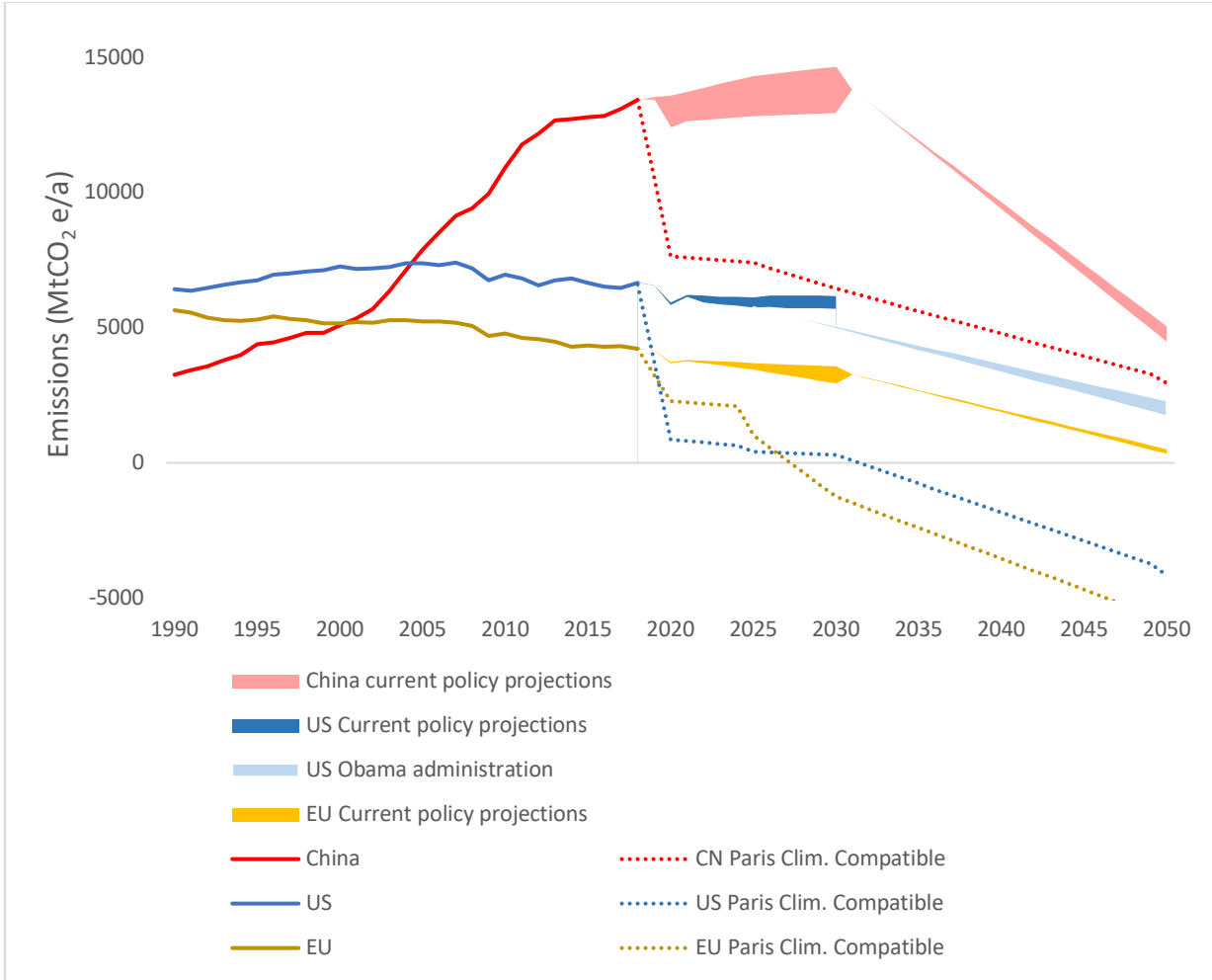


Source: Allianz Research, Data: OECD

Despite their progress, all three countries are still far from the path required to limit the rise in global temperature to 1.5°C. According to current policy projections (not including the forthcoming Five-Year Plan), China's greenhouse gas emissions in 2030 will be more than double its the level needed to comply with the Paris agreement (14,242 mega tonnes vs 6,452 mega tonnes). In this context, there is thus

a clear need for the financial sector to bridge gaps in green financing to take China's "green transformation" to the next level.

Figure 9: Greenhouse gas emission projections: 2.8°C current policies vs. 1.5°C Paris ambitions



Source: Allianz Research, Data: Climate Action Tracker²⁶

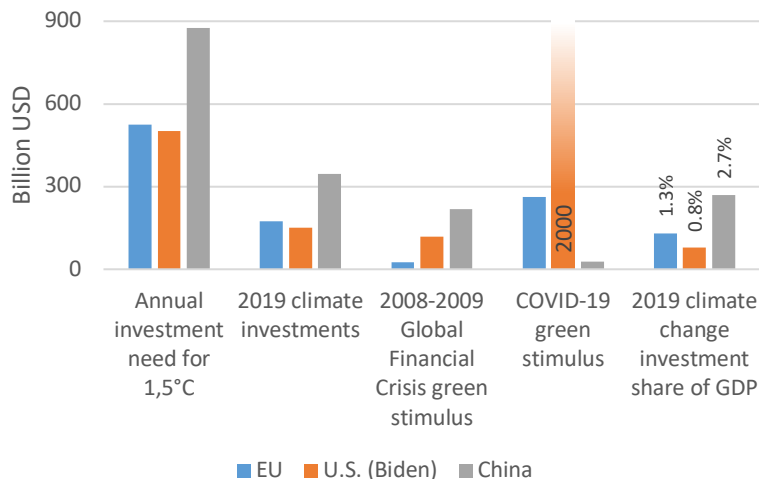
²⁶ For the policy projections and NDC, the Climate Action Tracker website focuses on emissions from energy consumption, industry, agriculture, and waste sources – representing about 93% of global GHG (Greenhouse gases) emissions. It does not consider GHG emissions from land-use, land-use change, and forestry (LULUCF) in current policy projections and NDCs. GHG emissions from LULUCF source are excluded from the consideration because a decrease in LULUCF emissions may distort the true state of decarbonisation by masking an increase in emissions from energy and industry sector.

5. The financial sector needs to step up to turbo-charge the green transformation

d. Green investments face a large funding gap

Though already relatively large, investments in climate change mitigation will still need to triple to achieve a level that is compatible with the Paris ambitions of limiting global warming to well below 2°C (see Figure 10). These investments need to be concentrated in the next 10 to 15 years to be compatible with the available carbon budgets and capture important re-investment cycles. In relative terms, the 2019 investments already accounted for 1.3%, 0.8% and 2.7% of GDP in the EU, US and China, respectively. Figure 10 also illustrates that green commitments in the current Covid-19 stimulus packages have multiplied compared to the sizeable commitments seen in the stimulus during the global financial crisis. Still, they can only complement private investment as they are far from sufficient to achieve climate neutrality on their own. According to an analysis by Cambridge Econometrics a strict orientation of the recovery towards climate goals would produce an additional growth impulse of close to 5% of GDP as is detailed in the Appendix “How green is the global recovery?” as well as some further details on the stimulus packages.

Figure 10 – Investments in climate change mitigation



Source: Allianz Research. Own calculations based on WRI (2020), Jaeger et al. (2020), EIB (2021), IRENA (2020). IRENA regional investment requirements are allocated proportional to TPES shares in non-renewable energy (China 78% of East Asian and U.S. 82% of North American NRE-TPES).

Research²⁷ shows that green finance remains far below the level needed to achieve the Paris goals. The IPCC²⁸ estimates that at least USD1.6-3.8trn in new climate investment is required for the supply side of the global energy system until 2050. This is significantly above the trend of climate finance in the past years (see Figure 11). Even greater collaboration among different economic actors will be needed to achieve climate goals.

²⁷ <https://www.greenfinanceplatform.org/page/explore-green-finance>

²⁸ [IPCC Special Report on Global Warming of 1.5°C](#)

For China, estimates of green investment needs vary, but all point to an important funding gap. According to research by the CCICED²⁹, as much as RMB9.55tn in annual investment over 2021-2030 will be needed to meet the green targets and standards that were established in 2015. The NCSC (2019)³⁰ finds that annual demand for funds to address climate change will rise to RMB4.15tn per year on average over 2021-2030, from RMB2.9tn over 2016-2020³¹. The ICCSD (2020)³² estimates that for China to achieve the 2°C transition pathway, the energy system will need new investment of around RMB3.33tn per year on average over 2020-2050. To achieve the 1.5°C transition pathway, new investment needs amount to around RMB4.60tn per year on average over 2020-2050.

In comparison, the Climate Policy Initiative (2021)³³ estimates that overall green finance averaged RMB2.1tn per year in 2017-2018. The NCSC (2019) finds that China will face an annual funding gap of around RMB1.4tn.

²⁹ “Green finance reform and green transformation”, China Council for International Cooperation on Environment and Development (2015)

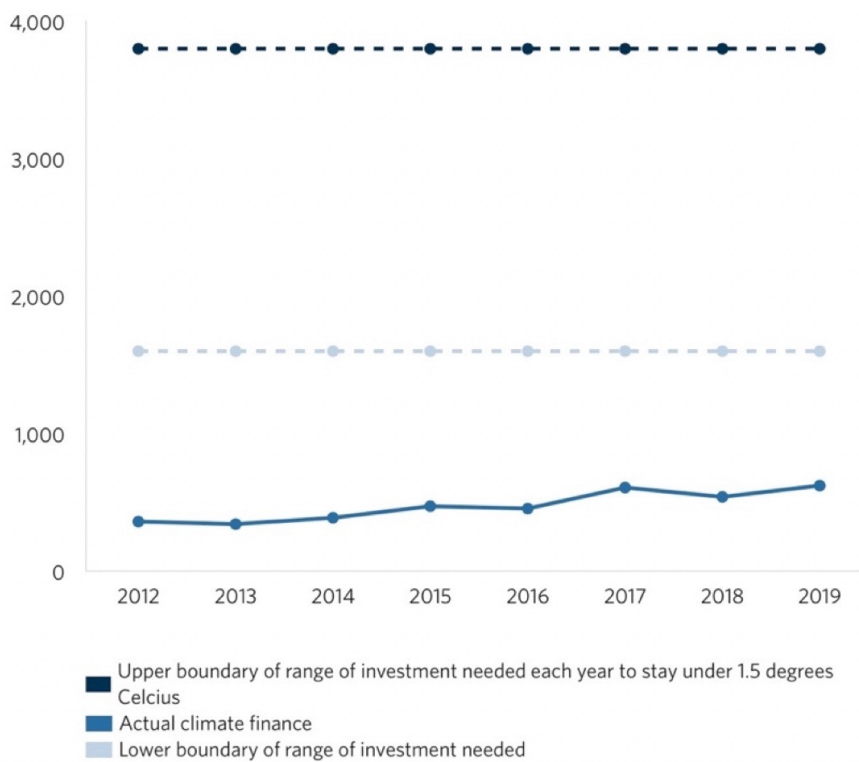
³⁰ “Financial needs in implementing China’s nationally determined contribution to address climate change by 2030”, NCSC (2019)

³¹ More precisely, the estimates find an average annual demand for funds of RMB2.9tn in the 13th five-year plan (2016-2020), RMB3.8tn in the 14th five-year plan (2021-2025) and RMB4.5tn in the 15th five-year plan (2026-2030).

³² “Study on China’s long-term low carbon development strategy and transition pathway”, ICCSD (2020)

³³ “The potential for scaling climate finance in China”, Climate Policy Initiative (2021)

Figure 11: Climate finance vs. Investment needed, at the global level (USD bn)

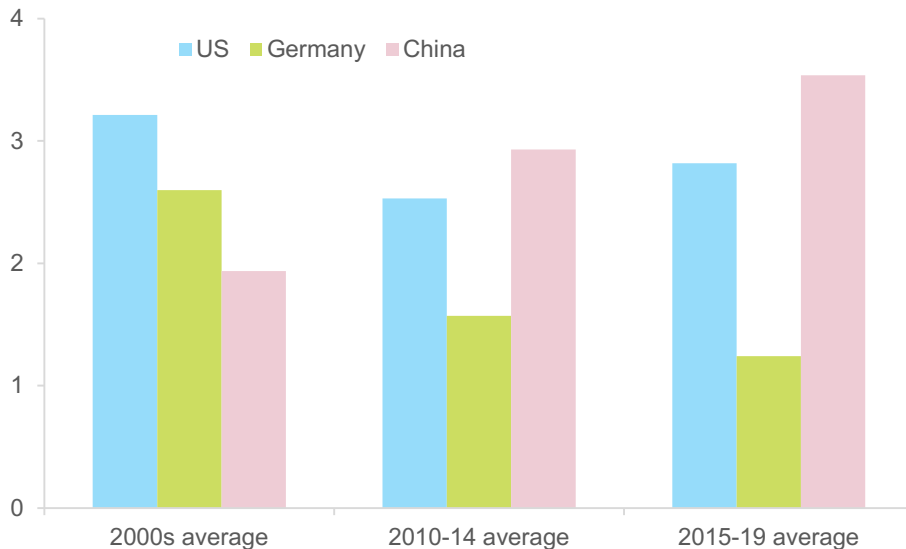


Source: Green Growth Knowledge Partnership

The need for a significant scaling-up in green financing comes at a time where China's credit efficiency has been declining. Our credit intensity index for China has been on a rising trend, indicating that an increasing amount of credit is needed to create 1 unit of GDP. In fact, the index had been declining between 2016-2018 (roughly in line with the deleveraging campaign), before rising again recently (with accommodative policies in the context of trade tensions and Covid-19). As authorities aim for a sustainable and balanced growth model in the long run, it is all the more important to prioritize financing of the right areas of the economy. The positive correlation between labor intensity and a green recovery³⁴ is an additional incentive for policymakers to direct the financial system and funding in favor of the green transformation.

Figure 12: Credit intensity

³⁴ "How a post-pandemic stimulus can both create jobs and help the climate" McKinsey & Company, May 2020.



Sources: BIS, IMF, Allianz Research

e. China's financial sector could play a bigger role

iii. The current landscape of green finance

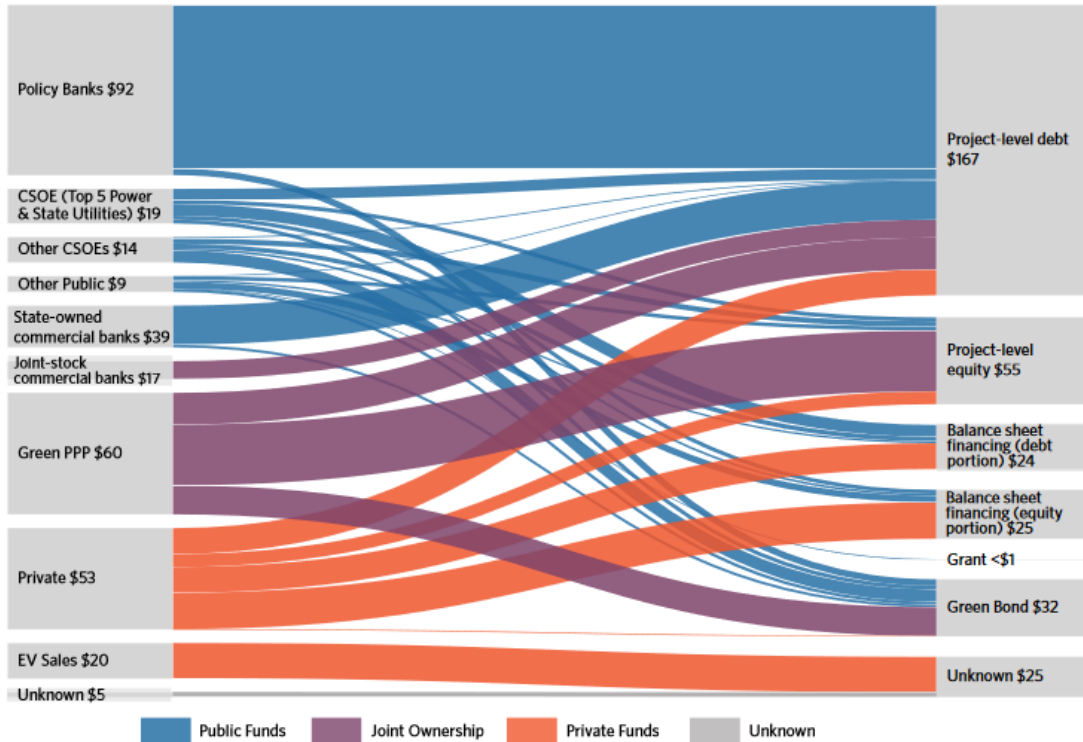
China introduced green finance as a major topic for the 2016 G20 summit and endorsed a nationwide blueprint for establishing a green financial system in the same year. So far, China's green financial reform has yielded quick results. Research³⁵ shows that outstanding green loans stand at over RMB10.6trn (USD1.5tn), more than double the amount at the end of 2013. Outstanding green bonds amount to RMB977bn (USD140bn), averaging +30% yearly growth since their introduction in 2016. In comparison, at the global level, the cumulative

³⁵ "The potential for scaling climate finance in China", Climate Policy Initiative (2021)

issuance of green bonds over 2007-2019 amounted to USD754bn. Separately, China has also established hundreds of green funds, as well as opportunities for green stock indices and insurance. In total, an average USD202bn was deployed per year in climate-related investments and an additional USD118bn in other environmental sectors over 2017-2018.

Figure 13 provides a breakdown of green finance by financing actor and instrument. An important point to note is that public sources accounted for 51% of total green finance, taking into account policy banks (44%), some central and provincial state-owned enterprises, state-owned banks and joint-stock banks; 21% of total green finance consists of public-private partnership projects and 24% are from private sources. There is thus large room for action to mobilize private capital in China's green transformation.

Figure 13: Estimated Instrument breakdown by financing actor (USD bn, yearly average over 2017-2018)



Source: Climate Policy Initiative

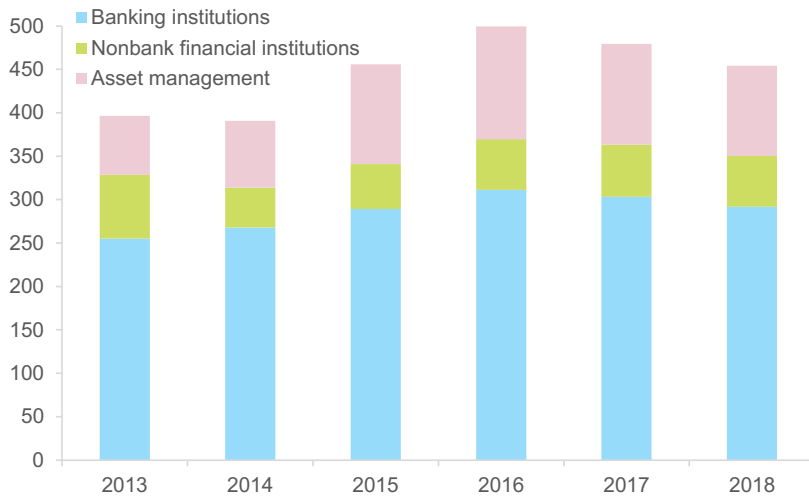
iv. Growth potential of green finance in China

There are two sources of growth for green finance in China: 1/ the overall financial sector is set to continue growing in the coming years and 2/ policies could be designed to further gear the sector in support of the green transformation.

China's financial sector is growing quickly (see Figure 14), and is set to continue to do so as the economy ages and savings are unleashed (see Figure 15). Gross

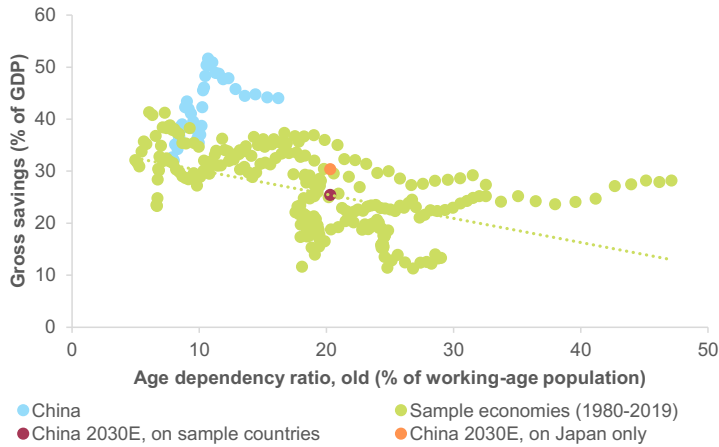
national savings stood at 45% of GDP in 2020 but they are set to decline as the population ages. The IMF already forecasts a decline to 40% of GDP in 2025.

Figure 14: Size of China's financial institutions (% GDP)



Sources: IMF-Financial Stability Assessment, December 2017, Allianz Research

Figure 15: Savings rate vs. old age dependency ratio, with forecasts for 2030 based on past experiences



Note: sample economies include Japan, South Korea, Taiwan, Russia, the Eurozone, the UK and the US. We estimated where China’s savings rate could stand in 2030, based on the experience of all sample countries, and based on Japan’s experience only.

Sources: IMF, World Bank, UN, Allianz Research

Second, the financial sector could be further focused on the green transformation. Research³⁶ shows that the current green penetration of China’s financial system stands at just c.4% (see Figure 16). As China’s capital market continues to evolve and actors become more familiar with green financial instruments, uptake in the market will grow.

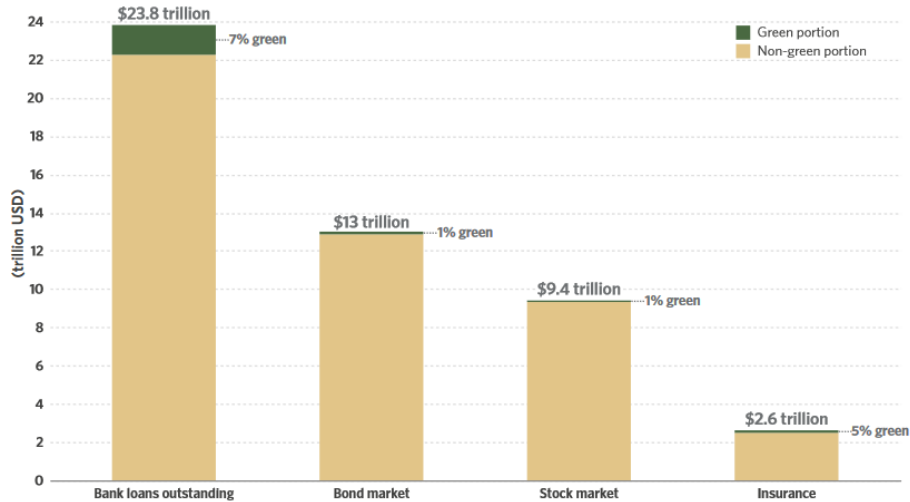
³⁶ “The potential for scaling climate finance in China”, Climate Policy Initiative (2021)

In fact, research³⁷ suggests that allocating more green loans in banks' total loan portfolios reduces the overall non-performing loan ratio. Indeed, data show that green loans delivered better financial performance, with an average non-performing ratio of 0.48% over 2017-2018, 1.81pp lower than that of corporate loans. Looking at green bonds, a total of USD124bn (RMB865.5bn) will reach maturity in the next five years, representing 88% of the total outstanding. Thus suggests a significant opportunity for green bond refinancing.

As for green stocks, discussions are underway to launch an expedited listing processes for green company IPOs, and multiple green indices and funds have been established. There has also been a spate of ESG-themed financial products made available to investors in China. Out of the 19 indices constructed based on comprehensive ESG scores, half were released in 2020. Similarly, total asset under management for ESG-themed funds in China grew by 50% this year compared to 2019.

Figure 16: Comparison of the green share in financial assets in Q1 2020

³⁷ "The impact of green lending on credit risk in China", Cui et al. (2018)



Note: the size of each asset class is based on CBIRC and CSRC data for Q1 2020.

The green portion is estimated in research by the Climate Policy Institute.

Source: Climate Policy Initiative

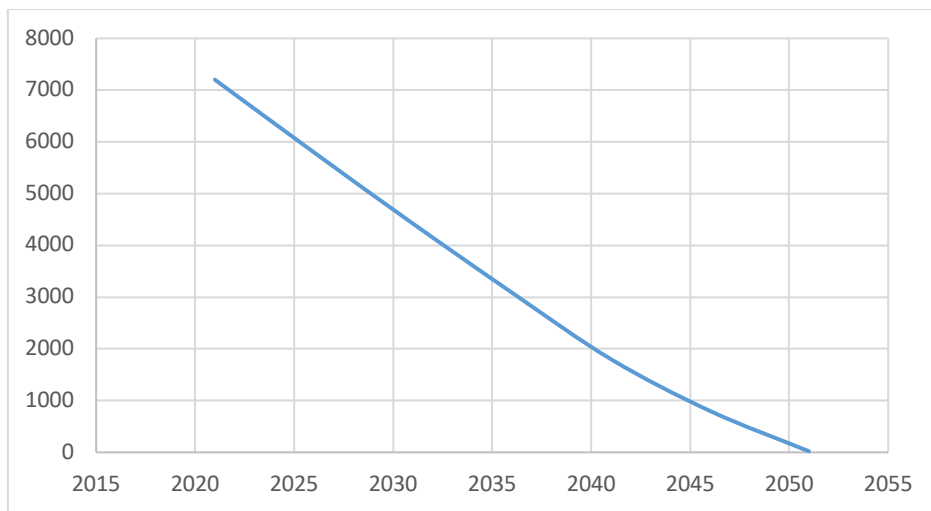
f. Asset owners can bring transformative changes to the real economy

iii. Enable an orderly transition by preventing and managing the climate-related transition risks

Domestic coal activities remain of concern in China, which lifted a previous construction ban on new coal plants in 2018 and has been adding capacity since. By mid-2020, China had permitted more new coal plants than in 2018 and 2019 combined.

As attractiveness for investors increases with progressing towards more sustainability, the associated structural change will necessarily require a strict cut in fossil fuel usage and particularly in electricity generation by coal. Cutbacks in the fossil fuel sectors will be more than offset by economic gains to growth and employment in other sectors, with even greater gains in biodiversity and health. Unfortunately, to materialize these gains, some existing assets linked to fossil energy are at risk of becoming stranded. This is most likely the case for coal power plants.

Figure 17: Coal power plans – estimated asset value at risk (RMB bn)

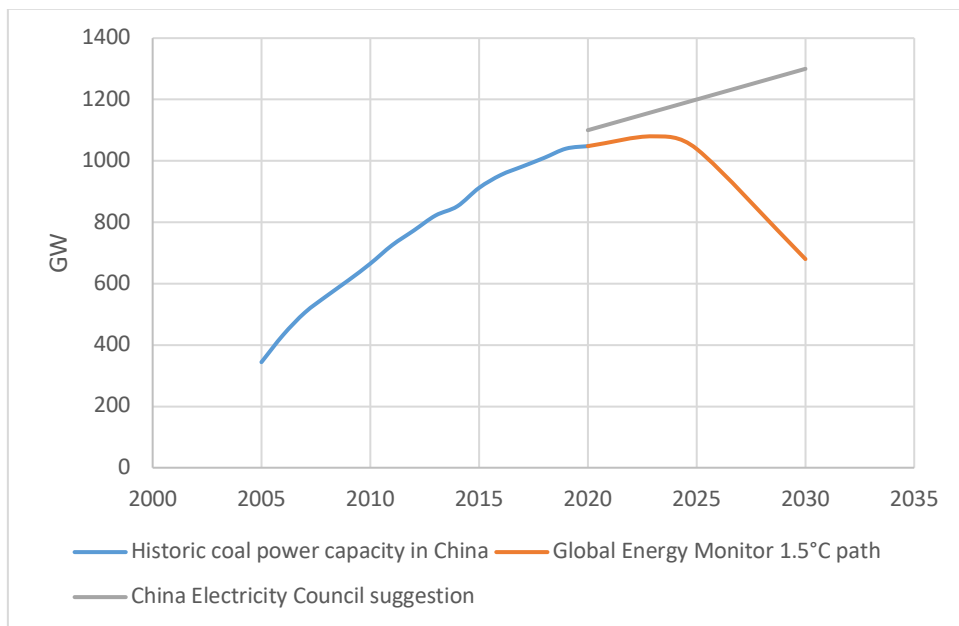


Source : Allianz based on Caldecott et al. (2016)

Figure 18 shows the value of the currently existing Chinese coal power plants that are at risk of getting stranded. The value will increase with more power plants to be

added and it declines over time in the figure as old power plants are decommissioned due to age. Additional assets that can get stranded are the ones linked to coal extraction. Their value is not assessed here. Part of the value of the coal power plants can already be considered as stranded, as overcapacities already cause an underutilization of the existing plants that results in investment costs not being recovered.

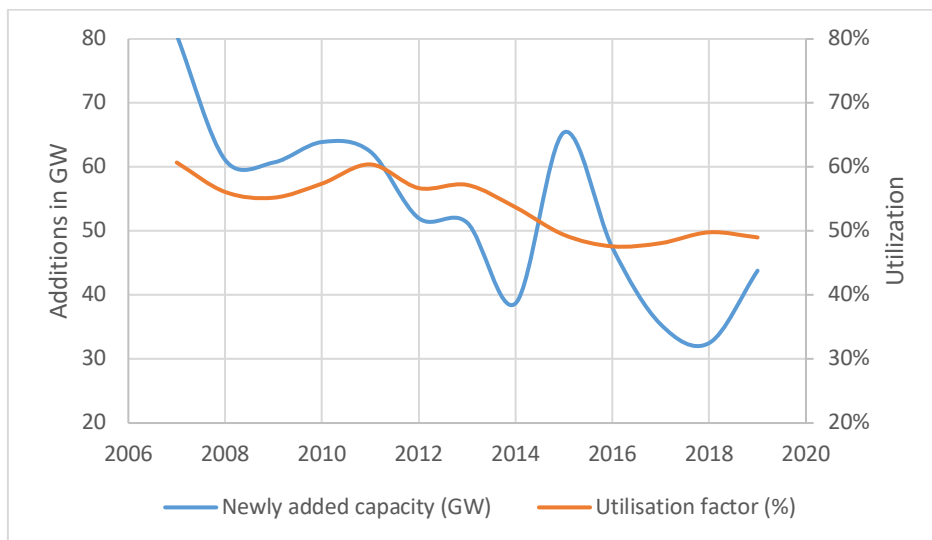
Figure 18: Coal power capacity in China for 1.5°C



Source: Allianz based on Myllyvirta et al. (2020)

More than half of coal-power firms are already loss-making and, as seen in Figure 19, typical plants are already running below 50% of their capacity with a clear downward trend. This will, as mentioned before, create a brown zombification problem that is expected to accelerate with increasing climate ambitions. The network operator state grid and the industry body China Electricity Council have been promoting targets that would result in hundreds of new coal-fired power stations being built. This contradicts the already existing overcapacities in the sector. As seen in Figure 18, to stay within a 1.5°C path, the utilized coal capacity needs to peak in 2023, and in 2030 only 63% of this capacity should be in use.

Figure 19: Coal power plants capacity additions and utilization rate



Source: Allianz based on Myllyvirta et al. (2020)

The development of China's coal-power overcapacity originates in the 12th Five Year Plan (2011-2015), which was a stimulus response to the global financial crisis. It targeted a huge expansion in coal mining and coal-fired power generation, a policy response that should not be repeated in light of the current crisis. Implementing a green recovery path from Covid-19 will be the key to materialize the potential economic gains of a green transition.

So far, green financial reforms have not impacted China's support for fossil fuels in a significant way. Green definitions in China have been contested for their inclusion of clean coal and other efficiency-related improvements for fossil fuels. Furthermore, exclusionary lists for fossil fuels have not been developed and China's key financial institutions have not made any public commitments to reduce investments in fossil fuels. Ensuring that progress is made on both climate-friendly and climate-harmful investments will be a key step forward for China's climate action in the coming years. Most recently in October 2020, high-level policy guidance for promoting climate investment and finance was jointly issued by five government and regulatory bodies, the first time "climate" finance and Paris Agreement targets were explicitly mentioned as policy objectives.

Asset owners can have an important role in supporting the Chinese administration to avoid assets from getting stranded by actively engaging with carbon intensive companies and work with them on transition strategies that induce a shift towards a low-carbon business model. Asset owners can be a major source to strengthen the technical capacities to address regulatory requirements (by conducting portfolio carbon footprinting, stress testing, etc). These assessments help to understand climate induced transition risks and physical risks in order to adjust portfolios and to ensure financial stability.

iv. Finance for tomorrow

Asset owners can finance the transition via climate-positive investments (including renewable energy in emerging markets, green buildings, sustainable forests, green hydrogen). In China, different areas of the financial sector along with local policymakers are exploring innovative climate finance tools (see Box below).

Box: Innovative climate finance in China

Three types of more innovative green financing channels are visible in China:

- **Consumer channels:** Digital retail consumer finance channels such as Alipay and WeBank are innovating new ways to encourage consumers, retail investors and SMEs to adopt green practices through their mobile payment platforms. In 2019, mobile payment transaction volumes reached RMB347.11trn (USD51trn) in China, an increase of more than 28 times from six years ago. Ant Forest was initiated in August 2016 on Alibaba's Alipay platform, incentivizing users to reduce their carbon footprint in exchange for a physical tree planted. In order to plant a tree, each individual has to grow a virtual tree through earning "green energy" on an individual carbon account from activities such as walking or taking public transportation, using online payment or avoiding plastic bags. By August 2019, over 500 million people across China were participating in Ant Forest, resulting in over 7.92 million tons of cumulative carbon avoided and over 122 million trees planted in arid regions in Inner Mongolia, as well as the Gansu, Qinghai, and Shanxi provinces.
- **Matchmaking platforms for SMEs:** One of the green finance pilot cities, Huzhou, is pioneering new approaches for matching local SMEs with green financing opportunities. To support the green growth of local SMEs, the municipal government launched a Green Finance One-Stop Service Platform in 2018. Since its launch, the platform has attracted over 16,000 SMEs, over 30 financial institutions and nearly 80 investors. In terms of green lending, over 13,000 SMEs have successfully received more than RMB160bn (USD23bn) in credit from banks. The platform provides three primary financial services for SMEs. First, it connects businesses with banks, facilitating the green lending process. The platform also compiles information on businesses nationwide, including commercial operations, tax and environmental performance, which makes data-sharing across provinces possible. Second, the platform directly connects businesses with investors, lowering administrative costs and increasing transparency. Investors may review detailed information and compare all available enterprises and projects; businesses can also attract more investors and expand their financing sources through the platform. Third, the platform establishes a green credit rating system to identify qualified green projects and businesses. The government plans to issue subsidies for those rated as "green."
- **Green insurance** is an important financial tool for internalizing the cost of environmental risks and managing performance risks. The risk prevention mechanism of insurance instruments can help increase climate resilience and encourage investment. There are two major types of green insurance in China: Environmental Pollution Liability (EPL) insurance and climate risk insurance. Although green insurance can be an important market mechanism for managing environmental liabilities and climate risks, it is still in the initial stages of development. Additionally, the proportion of China's insurance funds invested in the green sector is still low. Insurance companies' assets under management is around RMB17.8trn (USD2.6trn), of which only 5% (RMB882bn or USD130bn) is invested in green sectors.

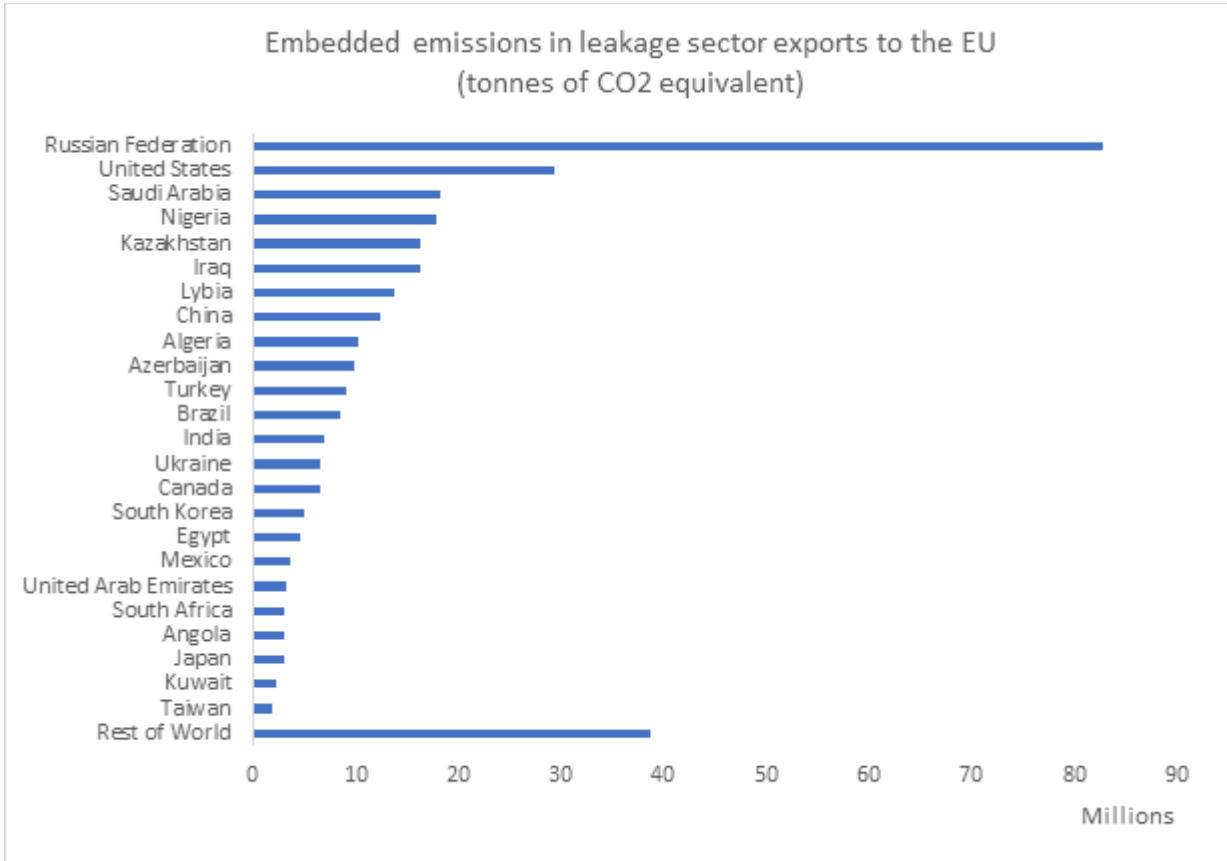
Source: Climate Policy Initiative

6. Policy recommendation on enhancing the green finance system and attracting international investors

d. Carbon tariffs: a possible way to build a global level-playing field

International actors in the private sector as well as governments are emphasizing the need of a level-playing field for moving the green transition forward. Otherwise, early movers would get punished and counterproductive behavior, such as carbon leakage, would be incentivized. Climate policies are expected to put a stringent price on carbon emissions, no matter where they occur, and to phase out fossil fuel subsidies. Carbon border adjustment mechanisms (CBAM), for instance in the form of carbon tariffs are expected to play an important role in this context, but a fair transition implies support for those who cannot bear the costs. Figure 20 gives an estimate of the emissions embedded in exports from various regions to the EU, revealing that China ranks 8, with its top three emission imports originating from chemicals, pharmaceuticals and aluminum.

Figure 20: Carbon embedded in exports to the EU by country or region (evaluated at EU sectoral emission intensities)



Source: Allianz Research

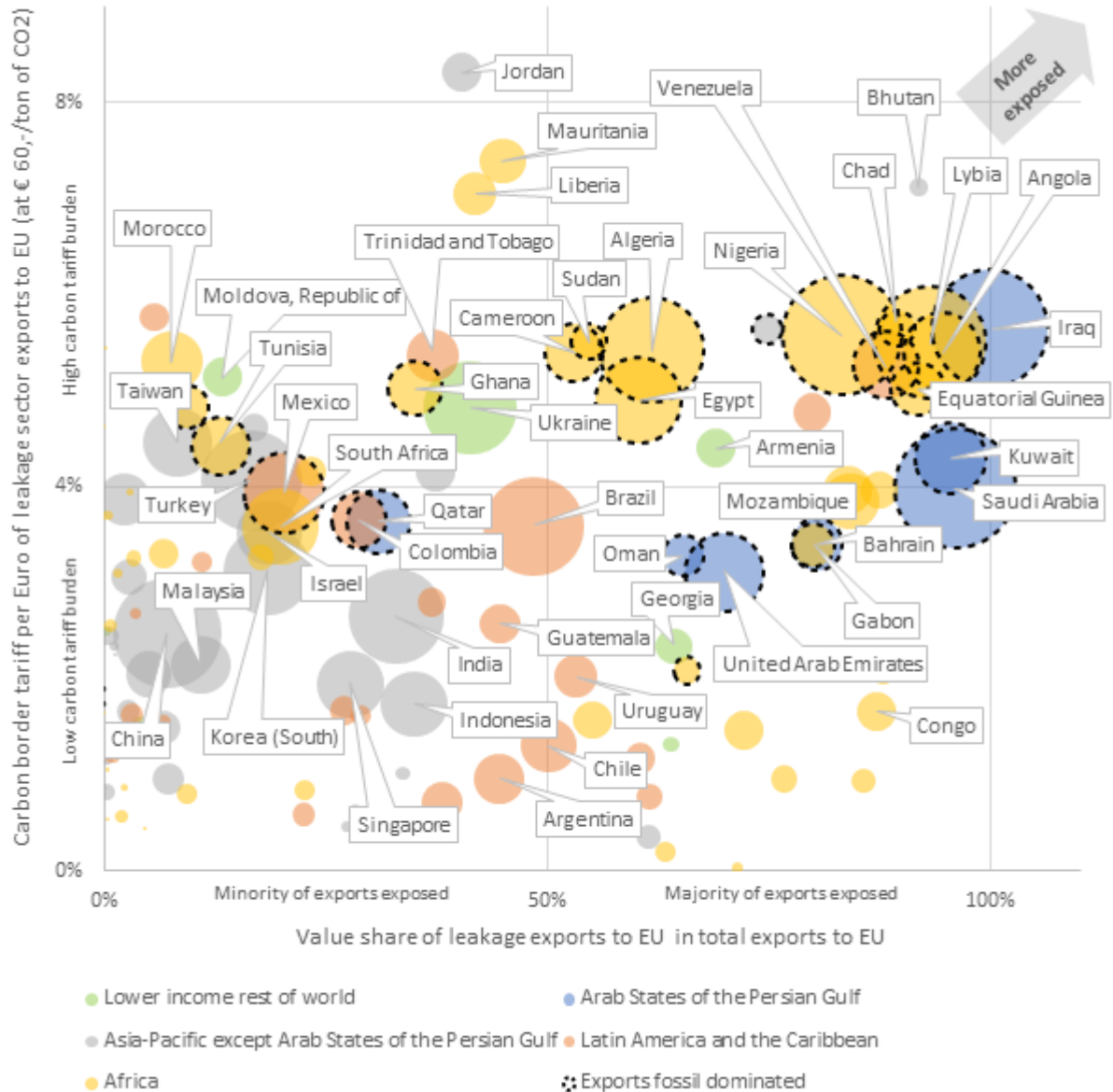
When it comes to relative exposure, the ranking is very different, as seen in Figure 21. Regions in the upper half will potentially face high carbon tariffs on the carbon leakage or ‘brown’ sector exports. The bubble sizes indicate the relative embedded absolute carbon content of exports to the EU. In the left half of the figure, only a small share of the respective regions’ exports to the EU are exposed to carbon

tariffs, while in the right half the majority of export value is generated in a ‘brown’ sector.

Statements within the European Commission consultation process with regard to the EU CBAM emphasized that bilateral CO₂ pricing commitments and mechanisms could act as a substitute to tariffs related to an European carbon border adjustment mechanism³⁸. This clearly indicated, that countries with sufficient climate policy stringency could eliminate carbon tariffs for its exports to the EU through bilateral agreements.

Figure 21 – Exposure of exports of developing and least-developed regions to the EU with emissions evaluated at €60,-/tCO₂ and at EU sectoral emission intensities as used for the carbon leakage list (bubble size proportional to square root of CO₂ emissions embedded in exports to EU)

³⁸ Using the possibility to substitute EU CBAM related tariffs by bilateral CO₂ pricing commitments and mechanisms has been highlighted on various occasions by different stakeholders in the EU CBAM consultation process. For additional details check the EU CBAM initiative website, particularly the response of the Autorités Françaises in the feedback round: <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12228-Carbon-Border-Adjustment-Mechanism>



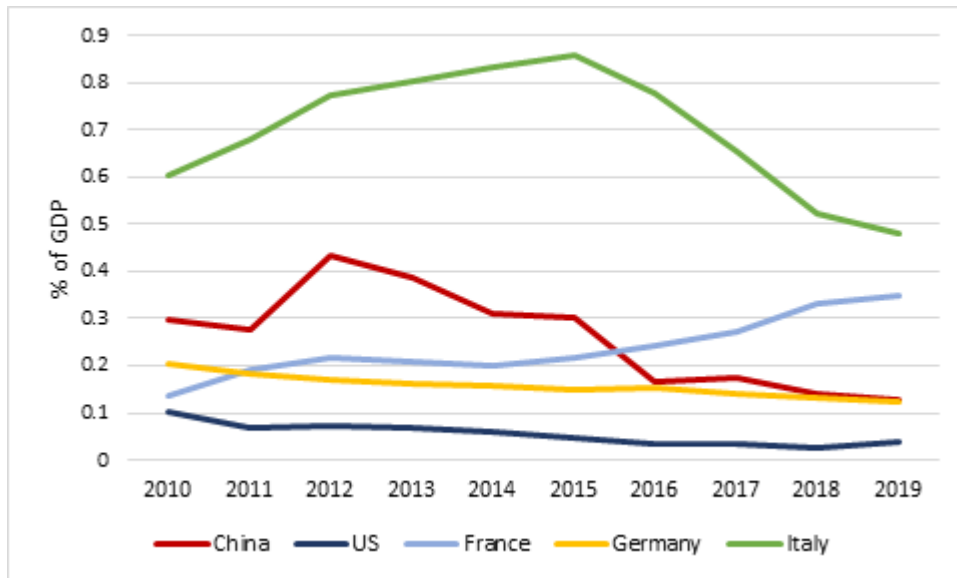
Source: Allianz Research

e. The right regulatory framework to attract international investors

iv. Ending fossil fuel subsidies

Ending fossil fuel subsidies is the flip side of subsidizing green technologies – and often overlooked. Fossil fuel subsidies can inhibit sustainable economic development and climate action progress by inefficiently allocating resources, distorting relative prices of energy and adversely affecting the price competitiveness of low-carbon energy businesses. At worst they lead to a brown zombification of the economy. A cross-country comparison of fossil fuel subsidies is not straightforward because there is no agreed upon unique definition of subsidies amongst countries. We use the OECD’s definition of fossil fuel subsidies, considering both direct budgetary transfers and tax expenditures based on an inventory approach. Figure 22 shows the development of fossil fuel subsidies as a percentage of annual GDP for China, the US and three big EU countries (Germany, France and Italy). In the case of both China and the US, the magnitude of fossil fuels as a percentage of GDP has been decreasing since 2010. However, at the end of 2019, China’s relative fossil fuel subsidies were still higher than that of the US. The development in the EU is less encouraging: Not only is the relative level of subsidies significantly higher, but the trend is also worrying, at least in France, where fossil fuel subsidies have increased threefold as a percentage of GDP.

Figure 22: Fossil fuel subsidies



Source: Allianz Research, Data: OECD

Reducing the fossil fuel subsidies not only lowers the brown zombification risk, but also allows financial resources to be used in the more productive green transition. This will result in the above-mentioned GDP growth prospects that will also be accompanied by the corresponding additional jobs and particularly in jobs that require higher qualifications.

v. Mandatory and harmonized ESG reporting

A steep increase in information availability is required to ramp up green finance. Without robust tracking and impact reporting standards, it will be difficult to ensure

that climate finance flows are being effectively allocated to projects that can generate the most impact. Currently, green finance policies only suggest some key metrics that actors can report at the aggregate level, using their own methodologies. Ensuring that reported climate impacts are ex-post and pro-rated to an actor's share of contributions to a project could be one way to improve impact tracking and avoid double counting. Mandatory climate reporting would also be key to attract investment flows from international capital markets.

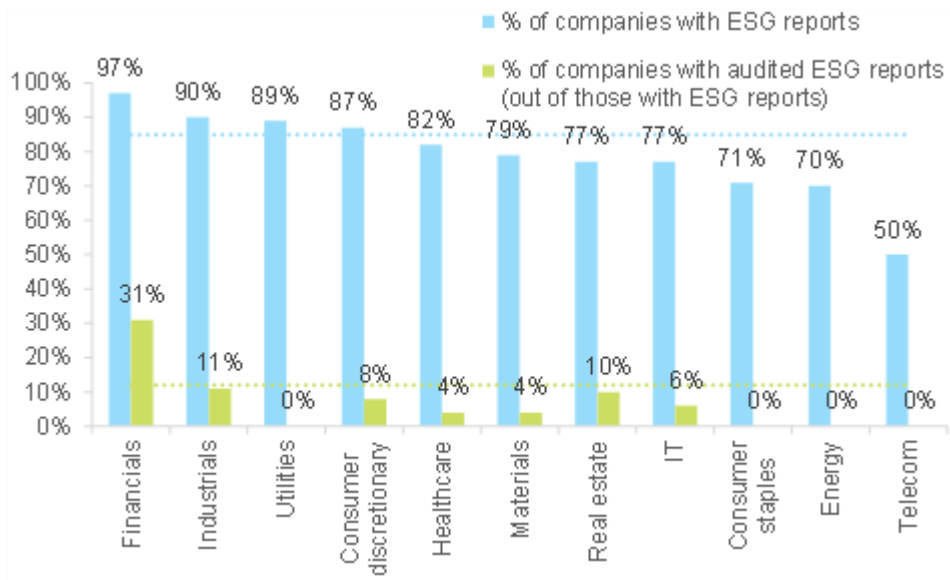
In China, an increasing share of listed companies now disclose data regarding their ESG performance, potentially making it easier to boost ESG-themed investments. However, among the companies that do disclose, a low share had audited reports, suggesting ample room for improving data quality. Furthermore, Chinese companies still lag behind their global peers in the scope and quality of their ESG disclosures. For example, the average Bloomberg ESG disclosure score of CSI300 companies ranks the lowest among companies of major stock market indices (i.e. compared with ASX200, Hang Seng, Nikkei 225, S&P500, FTSE100 and KOSPI200).

Figure 23: ESG disclosure rate among CSI300 companies



Sources: Wind, Ping An Digital Economic Research Center

Figure 24: ESG disclosure rate among CSI300 companies by industry, 2019



Sources: Wind, Ping An Digital Economic Research Center

Chinese regulators had set a goal for mandatory ESG disclosures for listed companies by the end of 2020, but it was delayed to 2021 due to the pandemic. Separately, foreign investors who invest in Chinese assets have to meet their fund domicile standards on ESG when investing in China, driving improved reporting by Chinese firms. The China Securities Regulatory Commission's forthcoming mandatory environmental information disclosure for listed companies is an opportunity to strengthen tracking and the monitoring of progress. The measure will

ask companies to report on their climate finance and are currently taking suggestions on which metrics to include.

To better guide companies in higher quality disclosures and data comparability, regulators should develop unified guidelines and converge on a set of the most material indicators. Regulators should build on guidelines from international organizations such as the Global Reporting Initiative (GRI) and [“Stakeholder Capitalism Metrics”](#) from the World Economic Forum, and integrate considerations specific to Chinese companies. Regulators should also encourage companies to audit their ESG disclosures. Better ESG disclosures and performance can help improve the credibility and value of Chinese companies for global investors.

With the EU Taxonomy, the Non-Financial Reporting Directive (NFRD), and the integration of sustainability in the financial sector disclosure regulation (SFDR), in the financial market regulation (MiFID II) and the insurance market regulation (Solvency II), the EU is far more mature with regard to the necessary amount of disclosure. The reporting of essential KPIs for performance evaluation started in March 2021 and will continuously extend and deepen over the coming years, leading to an ongoing ramp-up in reporting infrastructure within EU companies and a boom of ESG data and service providers.

On 25 February 2020, the Sustainable Finance Advisory Council (Sustainable Finance Beirat) of the German Government published its recommendations for the inclusion of sustainability criteria in finance products. It aims at transparently disclosing the ESG performance of financial investments, with the aim of diverging investment flows from ESG underperformers to overperformers. Financial market trends indicated that this idea might materialize strongly in the near future, even though it has been of limited relevance in the past. The German Sustainable Finance Advisory Council suggests the following key performance indicators for all finance products (not only sustainable finance products), which should be presented in simple adequate summary metrics, e.g. color codes for finance retail products.

Figure 25: ESG key performance indicators for financial products

Dimension	Category	Possible KPIs*
Environment	Climate Change	Global scope 1, 2 and 3 GHG emissions
	Energy Management	Total energy consumed broken down by non-renewable and renewable sources (including, electricity, heat, and primary energy use)
	Water Management	Total freshwater withdrawal and consumption, percentage of each in regions

		with high or extremely high baseline water stress
	Waste and Pollution	Total waste, percentage recycled Air emissions of pollutants (NOx, SOx, and particulate matter (PM))
	Ecological Impacts/Biodiversity	List of operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas
	Circular Economy	Percentage of recycled input materials used to manufacture the organization's primary products and services.
	Environmental Supply Chain Management	Number of suppliers assessed for environmental impacts Percentage of suppliers assessed for environmental impacts Percentage of purchasing volume covered with assessment for environmental impacts

Social	Labor Practices	<p>Percentage of active workforce covered under collective bargaining agreements</p> <p>Turnover rate</p> <p>Ratios of standard entry level wage by gender compared to local minimum wage</p> <p>Average hours of training per person by gender and employee category</p> <p>Breakdown of employees with permanent (indefinite) and fixed-term (temporary) contract</p> <p>Breakdown of directly employed workforce and not directly employed work-force (incl. temp agency workers, on-site contractors, freelancers)</p>
	Employee Health & Safety	Total number and rate of work-related fatalities and incidents
	Diversity and Equal Opportunity	Percentage of employees per employee category, by age group, gender and other indicators of diversity

	Human Rights	Total number and percentage of operations that have been subject to human rights reviews or human rights impact assessments, by country
	Social Supply Chain Management	Number of suppliers assessed for social impacts
		Percentage of suppliers assessed for social impacts
		Percentage of purchasing volume covered with assessment for social impacts
	Taxes	Total tax paid by country
Customer Privacy & Cyber Security	Number of data breaches and number of affected persons	
Additional categories could include community relations, public policy, product safety, responsible marketing...		
Governance	Business Ethics	Total number and percentage of employees that have received training on anti-corruption
	Sustainability Governance	List of committees responsible for decision-making on economic,

		environmental, and social topics and percentage of independent committee members per committee
	Remuneration	Remuneration policies for the highest governance body and senior executives including the consideration of ESG performance criteria and how they impact different types of remuneration
	Additional categories could include competitive behavior, opportunities in responsible investment...	
*The KPIs mentioned represent possible suggestions for mapping the categories mentioned. Alternative ways of representation are possible.		

Source: Sustainable Finance Advisory Board of the German Government

Particularly in the ESG-risk assessment, as well as in the ESG-evaluation of the delivery chains of the assets included in finance products and investments, the country ESG ratings play a prominent role. A peek into the competitive position for attracting investments can thus be gained from existing indices. While the environmental dimension is well explored, finding good proxies for the social and the governance dimensions is less straight forward. The components of the widely

used Social Progress Index are informative in this respect. It uses 51 social and environmental indicators to determine the social progress of a country across three broad dimensions: basic human needs³⁹, foundations of wellbeing⁴⁰, and opportunity⁴¹. China has made important progress in the past few years in the first two areas, and its index scores better than the global average. Conversely, in terms of opportunity, there is still room to improve in order to further attract international investment flows.

vi. Capital markets deepening and financial liberalization

The “Guidance on Promoting Investment and Financing to Address Climate Change” issued in October 2020 seeks to strengthen cooperation with foreign financial institutions in the field of climate finance, and to support the cross-border transfer of eligible green financial assets in China, allowing them to trade in offshore markets. Domestic financial institutions will also be able to engage in climate finance overseas, including through the establishment of yuan-denominated green investment funds and green loan funds overseas. Foreign financial institutions will be encouraged to issue green bonds in China, and

³⁹ Nutrition, basic medical care, water, sanitation, shelter, and personal safety.

⁴⁰ Access to basic knowledge and to information and communications, health, wellness, and environmental quality.

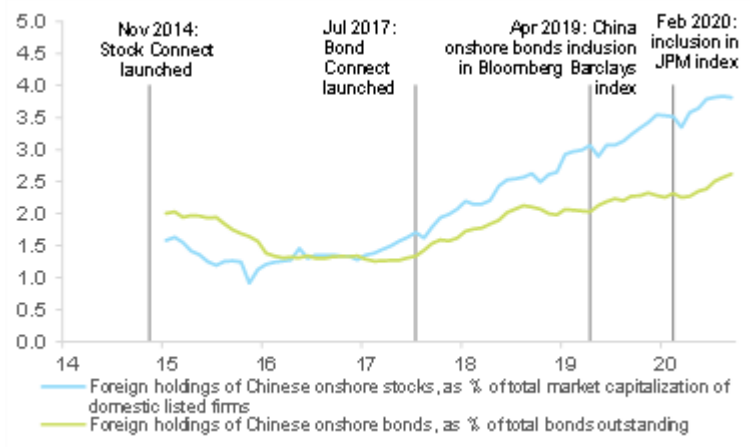
⁴¹ Personal rights, personal freedom and choice, inclusiveness, and access to advanced education.

to increase investments in domestic green assets, using the yuan as the cross-border settlement currency.

Foreign private capital only accounted for RMB9bn (USD1.34bn) of inbound climate finance flows in 2017-2018⁴² – compared with RMB2.1trn (USD320bn) of domestic climate finance flows. Such a small amount comparatively can be seen through the lens of China’s gradually opening but still relatively closed capital account. Indeed, foreign ownership of Chinese onshore stocks and bonds stood at respectively c.4.0% and c.2.5% (see Figure 26). These numbers had been gradually rising since 2017, in the aftermath of the 2015-2016 RMB and Chinese market concerns, and as a result of measures liberalizing foreign access to China’s capital markets. China is set to keep on easing access restrictions, with a cautious and sequenced approach.

⁴² “The potential for scaling climate finance in China”, Climate Policy Initiative (2021)

Figure 26: Foreign ownership of Chinese onshore securities



Sources: PBOC, CSRC, Allianz Research

Indeed, further financial liberalization and RMB internationalization are part of China's dual circulation strategy. These reforms are justified given the central role of China in the global economy and supply chains, the rising importance of Chinese

consumers and the growing role of China in global financial stability⁴³, payment and monetary policies. The RMB's global market share in several metrics remains low, considering the size of the Chinese economy. In terms of international transactions, according to data from SWIFT, the share of transactions in RMB stood at only 1.97% in September 2020. In terms of global FX reserves, in Q3 2020, 2.1% consisted in RMB-denominated assets. The increase is noticeable, considering that RMB assets only consistently started to be included in FX reserves in Q4 2016 (with the currency's inclusion in the IMF SDR basket). The RMB's inclusion is already higher than for the CAD, AUD and CHF (respectively 2.0%, 1.7% and 0.2%), but still far below the USD and EUR.

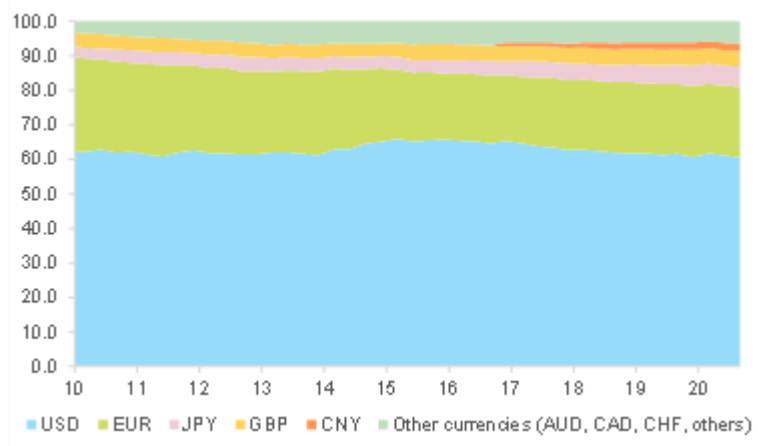
Figure 27: China's cross-border RMB trade settlement, as % of China's trade



⁴³ In the past, gradual financial liberalization had already been associated with rising asset prices in high income markets such as Australia or Canada.

Sources: PBOC, SAFE, Allianz Research

Figure 28: Distribution of global allocated FX reserves, by asset currency



Sources: IMF, Allianz Research

China has been pushing for financial liberalization in a gradual and sequenced way, and past experiences suggest that it should continue to do so. Strengthening the domestic financial environment – with strong financial institutions able to assess, monitor, regulate and prevent financial risks in a predictable way; enhancing financial literacy; strengthening the role given to market forces in order to avoid moral hazard and improving asset-liability management are also a key foundation for financial liberalization. Finally, we think that to be sustainable, financial liberalization should hinge on a prudent openness to financial technical innovations, such as artificial intelligence and data analytics, as well as new lending and payment methods.

Recent financial liberalization measures include the relaxation or cancellation of foreign ownership limits in financial sector firms based in China. For example, the EU-China agreement on investment signed at the end of 2020 will gradually remove joint venture requirements for firms in financial services (putting the EU on the same footing as the US). Such actions could facilitate global cooperation in green finance, and attract foreign investors to support China's green transformation.

f. International initiative and global cooperation

Finance (especially asset owners) can be an accelerator of the green transformation. In a context of demographic change, financing renewable energies and other infrastructure projects presents a win-win situation: Institutional investors are looking for profitable, reliable, long-term investment opportunities for retirement provision at a time of low interest rates. At the same time, the transition to the green economy requires capital over the long-term. Combining the two would benefit both the climate and the world's population equally.

Global cooperation on sustainable finance is also key to mobilizing the enormous leverage that only private capital markets can provide. Cooperation can convert billions into trillions. In October 2019, the EU and China along with six other countries (Argentina, Canada, Chile, Kenya, India and Morocco) launched the International Platform for Sustainable Finance (IPSF), a prime example for future intensification of cooperation in sustainable finance. The ultimate objective of the IPSF is to scale up the mobilization of private capital towards environmentally sustainable investments. Since its launch, other countries – Indonesia, New Zealand, Norway, Senegal, Singapore and Switzerland – have joined the initiative. Present member countries represent 50% of GHG emissions, 50% of the world's population and 45% of global GDP. The

IPSF therefore offers a multilateral forum of dialogue between policymakers that are in charge of developing sustainable finance regulatory measures to help investors identify and seize sustainable investment opportunities that truly contribute to climate and environmental objectives. Through the IPSF, members can exchange and disseminate information to promote best practices, compare their different initiatives and identify barriers and opportunities of sustainable finance, while respecting national and regional contexts.

[Assets owners are the key to delivering on the net-zero economy](#)

Similarly, institutional investors should work together to support environmental protection. The **UN-convened Net-Zero Asset Owner Alliance** was created in September 2019 by twelve founding members, including the world's largest insurance companies. The Alliance's asset under management doubled within a year, and now combines 34 of the world's largest pension funds, insurers and state-owned funds managing over USD5.5trn, establishing a good example of how institutional investors can work together to enhance climate protection and finance the net-zero transition. It is the first group of private finance players to announce 2025 targets and has been described by UN General Secretary António Guterres as the "gold standard" for net zero commitments. More precisely, members of the Net-Zero Asset Owner Alliance commit to:

- Portfolio emission reduction targets: achieve net-zero GHG emissions in investment portfolio by 2050, complemented by interim targets in five-year steps. The [*Inaugural 2025 Target Setting Protocol*](#) defines a 2025 emissions reduction target of between 16% and 29%, based on a 2019 baseline.
- Sector targets that focus on hard-to-abate sectors which would make or break the transition.
- Finance the transition: the Alliance's collective mechanism makes it easier for like-minded investors to fund emerging technologies as well as setting-up blended finance and public-private partnership structures, which create positive spill-over and signal effect on the broader market.
- Asset owners of the Alliance actively engage with issuers, asset managers, and policymakers to work together in favor of the green transformation. The Alliance is fully in line with the best-available climate science from the IPCC, and working jointly with the civil society.
- The Alliance has published position papers on mandatory reporting, phase-out of thermal coal, green recovery from Covid-19, etc.

Such organizations have important offerings for participants in Chinese financial markets and Chinese asset owners, and could contribute to China's climate target. The Net-Zero Asset Owner Alliance would equip Chinese asset owners with

the suitable analytical tools and methods to manage climate-related risks. It would invest in climate action, and eventually be the catalyst for mainstreaming green finance in China in support of the carbon neutrality target.

Appendix: How green is the global recovery?

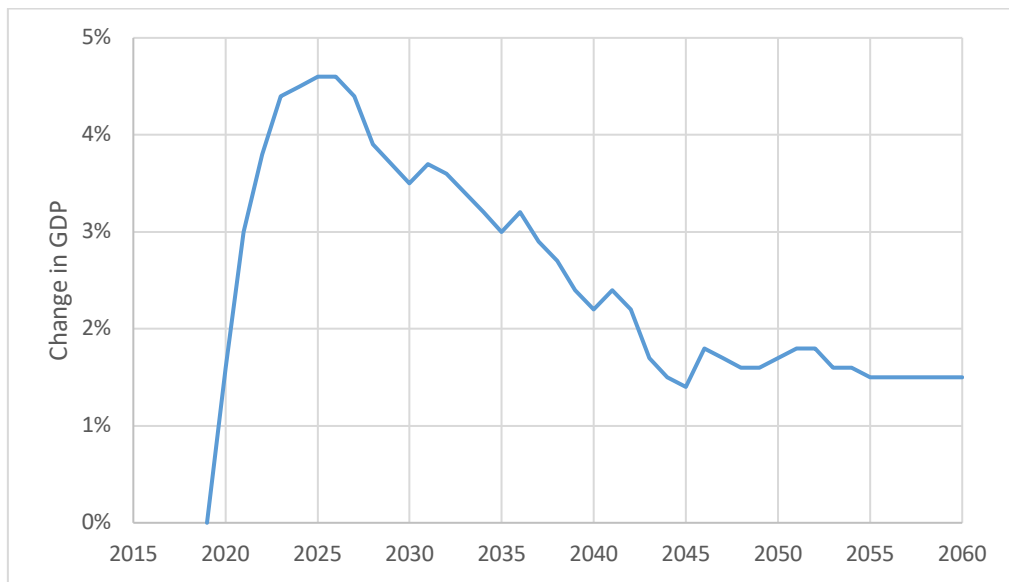
The economic rebuilding after Covid-19 represents a historic window of opportunity to accelerate the global transition to a net zero emission society. Moving from short-term rescue to longer-term recovery packages, the focus should also shift to long-term climate benefits. China and the EU seem to be ready to prioritize climate-friendly investments that stimulate economic growth. However, this also puts assets relying on fossil energy at risk.

At the UN General Assembly on 22 September 2020, Chinese President Xi Jinping pledged that China's CO₂ emissions will reach net-zero by 2060. This move may not only help the climate – it could lower the global mean temperature increase by around 0.25°C – and China's soft power, but may also pay off in pure economic terms. According to an analysis by Cambridge Econometrics⁴⁴, this will have a positive overall net impact on China's GDP, resulting from a combination of positive spillovers from the investment activities in other sectors, enhanced technological progress and leadership in green technologies, reductions of the fossil-fuel import bill and an increase in self-sufficiency and consequently a strengthening of the domestic market. As a result, in the Cambridge Econometrics analysis, China's GDP could increase by close to 5% in the net-zero scenario

⁴⁴ <https://www.carbonbrief.org/analysis-going-carbon-neutral-by-2060-will-make-china-richer>

relative to the baseline, as shown in Figure 29. However, at this stage, there is (very) low visibility on the measures under the new climate target. In order to materialize the potential growth prospects, recovery policies have to adjust adequately to increase the existing ambitions in investing in the green transition.

Figure 29: Reaching net-zero by 2060 would raise China's GDP (Change in China's GDP in the net-zero pathway, relative to the baseline)



Source: Cambridge Econometrics modelling via www.carbonbrief.org

According to our research already previously displayed in Figure 10, the Covid-19 recovery stimuli are greener in the US and EU than in China. Compared to the total

Covid-19 stimulus, the green stimulus share is around 20% in the EU. Pre-Biden green commitments were just around 1% of the US stimulus, but the current announcements aim at a green stimulus above USD 2trn, which would increase the green share of total US stimulus to above 30%. In comparison, in 2008-2009, the US spent 12% of its total economic stimulus on green measures. In China, the green share of total stimulus is less than 5% based on our assessment of the Covid-19 stimuli announced by the Chinese government.

Going forward, green elements will be indispensable to create a more balanced and inclusive economy. China has committed to a New Infrastructure Plan by 2025, focusing on cutting-edge technologies, digital infrastructure and electric mobility projects (e.g. charging infrastructure and public transit). The 14th Five-Year Plan does not increase mid-term climate ambitions relative to the previous Five-Year Plan. The announced reduction of the carbon intensity of GDP by 18% and energy intensity of GDP by 13.5% in the next five-year period is only consistent with the official roadmap to carbon neutrality by 2060 if a two speed approach is implemented. To limit global warming to below 1.5°C and reduce local environmental pollution impacts an early peak in emissions is desirable. A later emission peak might reduce transition costs as green technology prices are dramatically decreasing, but entering the market too late also poses the risk to miss

the connection to the technology leaders. Additionally, the Five-Year Plan sets the target to basically eliminate heavy air pollution by 2025, cleaning up the nation's rivers, restoring wetlands, and boosting forest coverage to 24%.

Bibliography

Caldecott, B., Kruitwagen, L., Dericks, G., Daniel J., Tulloch., Kok, I., Mitchell J. Stranded Assets and Thermal Coal An analysis of environment-related risk exposure, Stranded Assets Programme, SSEE, University of Oxford, January 2016.

China Council for International Cooperation on Environment and Development, 2015. Green Finance Reform and Green Transformation.

Climate Bonds Initiative, 2020. “Green Bonds Global State of the Market 2019 report. https://www.climatebonds.net/system/tdf/reports/cbi_sotm_2019_voll_04c_0.pdf?file=1&type=node&id=47577&force=0

Climate Policy Initiative, 2021. The Potential for Scaling Climate Finance in China.

Cui, Yujun et al., 2018. The Impact of Green Lending on Credit Risk in China.

de Coninck, H., A. Revi, M. Babiker, P. Bertoldi, M. Buckeridge, A. Cartwright, W. Dong, J. Ford, S. Fuss, J.-C. Hourcade, D. Ley, R. Mechler, P. Newman, A.

Revokatova, S. Schultz, L. Steg, and T. Sugiyama, 2018: Strengthening and Implementing the Global Response. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

EIB (2021). Investment Report 2020/2021 – Building a smart and green Europe in the COVID-19 era.

Gosens, J. and Jotzo, F. (2020), China's post-COVID-19 stimulus: no Green New Deal in sight. CCEP Working Paper 2006, July 2020. Crawford School of Public Policy, The Australian National University. <https://ccep.crawford.anu.edu.au/publication/ccep-working-paper/17184/chinas-post-covid-19-stimulus-no-green-new-deal-sight>

Green European Foundation, 2014. Money for Change: The financial sector in the green economic transformation, analyses and policy recommendations.

IEA (2020b). Commissioned EV and energy storage lithium-ion battery cell production capacity by region, and associated annual investment, 2010-2022, IEA, Paris <https://www.iea.org/data-and-statistics/charts/commissioned-ev-and-energy-storage-lithium-ion-battery-cell-production-capacity-by-region-and-associated-annual-investment-2010-2022>.

IRENA (2020). Global Renewables Outlook: Energy transformation 2050. ISBN :978-92-9260-238-3. <https://www.irena.org/publications/2020/Apr/Global-Renewables-Outlook-2020>.

ICCSA (2020). Study on China's Long-Term Low Carbon Development Strategy and Transition Pathway, Institute for Climate Change and Sustainable Development at Tsinghua University (2020). 《中国长期低碳发展战略与转型路径研究》, 清华大学.

Jaeger, Joel, Michael I. Westphal and Cory Park (2020). Lessons learned on green stimulus: Case studies from the global financial crisis. WRI Working Paper. <https://wriorg.s3.amazonaws.com/s3fs-public/lessons-learned-on-green-stimulus-case-studies-from-the-global-financial-crisis.pdf>.

McKinsey & Company, 2020. How a post-pandemic stimulus can both create jobs and help the climate.

Myllyvirta, Lauri, Shuwei Zhang and Xinyi Shen (2020). Will China build hundreds of new coal plants in the 2020s? Carbon Brief. www.carbonbrief.org/analysis-will-china-build-hundreds-of-new-coal-plants-in-the-2020s.

NCSC (2019). Financial needs in implementing China's nationally determined contribution to address climate change by 2030, 《中国实施 2030 年应对气候变化国家自主贡献的资金需求研究》, 国家应对气候变化战略研究和国际合作中心.

Wang, 2018. Financing Green: Reforming Green Bond Regulation In The United States, 12 Brook.J.Corp. Fin. & Com.L.. <https://brooklynworks.brooklaw.edu/bjcfcl/vol12/iss2/9>

WRI, Joel Jaeger (2020). Lessons from the Great Recession for COVID-19 Green Recovery. WRI Blog. <https://www.wri.org/blog/2020/11/coronavirus-green-stimulus-great-recession-lessons>.